



Profitability of Natural Rubber Production and Processing: A Case of Delta Rubber Company Limited Okomoko/Umuanyagu Etche, Rivers State.

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ABSTRACT

The study examined the profitability of Natural Rubber Production and Processing by Delta Rubber Company Limited, Okomoko/Umuanyagu Etche, Rivers State. The objectives of the study were to assess the average yield of rubber plants per hectare from the different plantations, to examine the annual turn-over and profit of the company for the period 2001-2004 and to identify the problems affecting the operation of Delta Rubber Company Limited. The Company has five (5) Rubber Plantations with a total hectareage of Ten Thousand Seven Hundred (10,700) hectares. Also the company has a crumb rubber processing factory situated at Umuanyagu Etche, with a capacity of about Six hundred (600) metric tonnes of crumb rubber per month or 23MT per day. But it is presently operating between 20-40% capacity utilization, processing about 10-12 MT per day. A review of the balance sheet and income statement of the company for the years under review showed that there was an increasing inflow of profit. Various analysis based on NPV, BCR, IRR, CCR, NCR shows as follows-($NCR > 1$) 1.78, 3.85, 3.89, 4.36 for the period of 2001, 2002, 2003, 2004 while ($CCR > 1$) with 0.804, 1.28, 1.56, 1.45, Return on Assets (ROA) was 114.7%, 89.7%, 84.37%, 77.4% all proves that the Delta Rubber Company made profits during the period under review. However, some problems were identified such as insecurity frequent stealing and vandalization by youth, inadequate attention by the Government. The researcher therefore recommended that there should be improved company/host community relationship, adequate security arrangement and additional capital funding by the state Government to enable the company expand its scope of operations, and produce export grade crumb to attract foreign exchange and boost our Agro-sector economy.

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I. INTRODUCTION

Rubber and Oil palm crops are closely related as important tropical and cash crops in Nigeria, infact they have been described as the most coveted and most publicized of all tropical crops.

Rubber is one of the agricultural products (Cash crop) that Nigeria and West Africa has been known for. National rubber, botanically known as *Heavea brasiliensis* is the most popular latex producing tree. The history of rubber production in Nigeria dates as far back as 1894 when the first rubber seed from Ken Gardens England was introduced into Nigeria and planted in Sapele rubber estate in 1903, and also at Nkisi rubber estate in the then Eastern Nigeria in 1912. (Uraih, 1980), Giroh (2007).

The rubber tree has a milky white secretion called latex which is obtained by tapping (cutting the bark of the tree) spirally to allow the flow of fluid into a collecting cup. This fluid when exposed to higher temperature will coagulate and form lump. The coagulated lumps are subsequently processed into dry forms for marketing. The rubber tree (Natural rubber) takes about 5-7 year before commencement of tapping, however, some early maturing ones have been developed by the rubber Research institute (RRIN), the planting space of 6.7m x 3.3 which give about 459 plants/ha is most appropriate (Williams *et al.* 2001), Aigbekaen *et al.* (2000).

Improvement in yields hectare have been recorded through breeding programmes at the Rubber Research Institute (RRIN), from 200-400 ka/ha per year to about 3500 kg/ha per year (National Agric Research project (NARP 1998).

The use of Natural rubber can be divided into;

1. **Uncured National Rubber:-** This is gummy- it is easily deformed when warm and brittle when cold. The uses of this kind are for footwear, cement, insulators, blankets, adhesives and fabrication tapes.

2. **Vulcanised rubber**- These are form of natural rubber which have been subjected to chemical processes in order to convert them into more durable materials by the addition of sulphur. This ones are less sticky and possess superior mechanical properties, they have higher resistance characteristics to abrasion. They are used for softer kinds of rubber valuables like conveyor belts, Treads and vehicle tyres, as well as other hard rubber valuables like rubber pipes, hoes, Gloves, masks and flooring materials etc.

Natural rubber performs three main functions in our national economy, such as provides foreign exchange earnings and also offers employments to a sizeable portion of Nigerian rural farming population (Aigbekean *et al* 2003).

In the year 1979, the Nigerian Government formulated an economic policy to increase her resources base and to facilitate accelerated growth in the agro-sector. This however, led to the establishment of some agro-companies in which Rison Palm Limited was established in Rivers State. Delta Rubber Company Limited has a total of five rubber plantation /Estate situated at Abara, Odagwa, Okomoko/Umuanyagu, Umuoye and Ubima/Elele all in Rivers State. The total hectarage of rubber plantation is about (10700) Ten thousand Seven hundred ha.

The crops have average of daily yield of 200kg or 0.2 metric tons per hectare. The crumb rubber processing factory has a capacity of processing Six (600) hundred metric tonnes or 23 MT. Per day. In 1990 Nigeria became the largest producer of Natural rubber in Africa, this title has since been taken over by (Ivory Coast) Cote'd Ivoire. The trend indicates that total capacities for Nigeria output are expected to fall by at least 50% in coming years if nothing is done (DRJ-2017). More so, because of neglect by the Government the value of rubber as a cash crop is very far below its maximum potentials, Nigeria is loosing upwards of N86 billion in potential revenues because of her inability to supply rubber export, to the rest of the world market, the total Global market demand for natural rubber is about 12 million MT/year at a price range of about \$82-3000 per tonne. This situation however, has becomes a source of great concern in the mind of many investors and as well as scholars. It is an obvious fact that since the discovery of oil and subsequent exploration and exploitation of petroleum in Nigeria, the agricultural sector has suffered much neglect and set-back. Consequently, this neglect has affected the growth of most agro-based industries in Nigeria and Rubber producers are not left out, as there has been a downward trend in the output and export of natural rubber products in recent years (FAOSTAT, 2004). The objectives of this study includes: To assess the average yield of rubber plants per hectare, annum, from the different rubber plantation owned by the Delta Rubber Company. To examine the annual turn-over and profit of the company for the period of 2001-2004. To identify if any, the problems affecting the operations of Delta Rubber Company limited and to make possible recommendations. The findings or result of this study will provide the basis for improvement and expansion of rubber production and processing by the Delta Rubber Company Limited. It will also serve as a basis for further studies in related field to improve the profitability of the company, also policy makers will find this study useful, especially as it concerns economic diversification and growth.

II. METHODOLOGY

Study Area

This study was carried out in Etche Local Government Area of Rivers State. The local Government Area is situated on the North-East Area of Rivers State. The Local Government Area shares inter- state boundary with other two neighbouring states of Imo and Abia States. Etche is blessed with abundant wide range of fertile land which supports the growth of several agricultural crops like Plantain, Banana, citrus, vegetables, grains (maize), yam, cassava, oil palm trees and Rubber etc. The people of Etche are predominantly farmers and they are known for production of crops like yam, cassava, plantain. The presence of the Imo Rivers, Otamiri and Ogochie rivers makes fishing activities very prominent as well.

Types and Sources of Data

For the purpose of this study, data were collected from both primary and secondary sources respectively. The primary data for this work includes information from administered questionnaire, personal interview and company records. On the other hand, secondary source includes, Journals, News papers and textbooks. According to the administrative units of the Delta Rubber Company Limited, there are five units viz; Administration, finance, production/factory, Estate and security departments. From each of these units/departments, four persons were purposively selected and research questionnaire was administered and retrieved. Furthermore heads of each of department were personally interviewed.

On the other hand, the annual reports of the Company for the years 2001, 2002, 2003, 2004 were also examined and information extracted for analysis.

Analytical Techniques

The researcher employed a number of analytical measures to evaluate the performance of rubber crops from the different locations/Estates as well as the performance of the crumb factory/processing plant.

Analytical tools like tables, chart, percentages were used to compare output and the processing plant output capacity for the different years. Statistical evaluation based on the use of Net Present Value (NPV), Benefit cost Ratio (BCR), Internal Rate of Returns (IRR) were carried out to ascertain the viability of the company's operations. Also current Capital Ratio's calculated for the different years under review. These enabled the study to make adequate comparison of the company's output to ascertain profitability.

III. RESULTS AND DISCUSSION

Table 1.0 Rubber output per day/month/year in metric tons.

Estate/Location	Hectarage	Output/Day	Month	Year
Abara	2000	400mt	12000	144,000
Odagwa	2000	400mt	12000	144,000
Okomoko/Umuayanayagu	2100	420mt	12600	151,200
Umuoye	2000	400mt	12000	144,000
Ubima/Elele	2600	520 mt	15600	187,200
Total	10,700	2140	64,200	770,400

Source: Field survey, May 2005

Table 1.0 shows estimated rubber output from the different locations. The output per day output per month and annual yield of crops from the different locations shows that given the average yield of 0.2 ton per day, the total output per day was about 2140 metric tons, while total output per month was about 64,200 metric tons, with annual output of 770,400 metric tone.

RUBBER SALES

Table 2.0 Rubber sales in Naira for the years 2001-2004

Years	Crumb	Product/Sales Lump	Wood	Total
2001	85,374,453	500,000	842,693	86,717,146
2002	73,520,000	8,049,363	246,358	81,815,721
2003	80,250,000	10,334,344	650,000	91,234,344
2004	70,734,000	6,628,336	204,386	77,566,722
Total	309,878,453	25,512,042	1943,437	337,333,933

Source: Annual Report Delta Rubber company Limited 2001-2005

Going through Table 2.0, it is seen that the highest sales were recorded in the year 2003 with a total sale of over Ninety one Million Naira (N91,234,344.00). This is also followed by the year 2001 with a total sale of over Eighty Six million Naira. (N86,717, 146.00) the lowest sales were recorded in the year 2004, this was due to the problem between the company and one of the host communities, Ubima/Elele when the estate was seized and company equipment were vandalized by the restive youths from the area. This incident automatically affected the output of that year and resulted in low sales and low turnover.

Table 3.0 Estimated revenue from the crumb rubber processing factory at different percentage capacity utilization and at a price range 240,000-320,000 per metric ton.

A=100%; B = 50% ; C = 22%

A:	Output/Month	Price/Metric Ton	Price/Metric Ton
	600 metric tons	240,000	320,000
Monthly Revenue		144,000,000	192,000,000
Annual Revenue		1,728,000,000	2,304,000,000
B:	Output/Month	Price/Metric Ton	Price/Metric Ton
	300 metric tons	240,000	320,000
Monthly Revenue		72,000,000	96,000,000
Annual Revenue		864,000,000	1,152,000,000
B:	Output/Month	Price/Metric Ton	Price/Metric Ton
	130 metric tons	240,000	320,000
Monthly Revenue		31,000,000	41,600,000
Annual Revenue		374,000,000	499,200,000

Sources: Field survey May, 2005

Table 3.0 shows that the crumb rubber processing factory has a full capacity of processing about 600 metric tons of crumb rubber in a month and given the two price range of 240,000-320,000/metric ton, we can see that at 240,000/metric tone we have a monthly revenue of 144,000 and an annual revenue of 1,728,000,000. But if sold at 320,000/metric tone we have a monthly revenue of 192,000,000 and an annual revenue of about 2,304,000,000. This is at 100% capacity utilization.

The table also showed that at 50% capacity utilization it could process about 300 metric tons of crumb in a month, with the different prices of 240,000 and 320,000/metric ton, we have a monthly revenue of 72,000,000 and 96,000,000 and an annual revenue of 864,000,000 and 1,152,000,000 respectively. On the other hand at 22% capacity utilization, the machine process revenue of 31,000,000 and 41,600,000 or an annual revenue of about 374,000,000 and 499,200,000 respectively.

Comparing the two tables 2.0 and 3.0 it was shown that, the crumb sales in table 2.0 shows that Delta Rubber Company crumb factory was functioning between 20-40% capacity utilizations. This situation is a proof of gross under utilization of the factory equipment, this trend is very common to most Agro-equipments in Nigeria and this eventually results in non-development of Agriculture in the country.

Table 4.0 Estimated monthly sales of lump from the different estates/location price range of 30,000 and 35000 per metric ton.

Estate/Location	Output/Month	Prices in "N" N30,000	
			N35,000
Abara	12,000 metric ton	360,000,000	420,000,000
Oduagwa	12,000 metric ton	360,000,000	420,000,000
Okomoko/Umuanyagu	12,600 metric ton	378,000,000	441,000,000
Umuoye	12,000 metric ton	360,000,000	420,000,000
Ubima/Elele	15,600 metric ton	468,000,000	546,000,000
Total	64,200 metric tons	1,926,000,000	2,247000,000

Source: Field survey 2005.

Considering the data on Table 4.0 above, given the prevalent lump prices of between 30,000 and 35,000 per metric tone of lump, we can rightly see the company will make sales that runs into Billions and Millions of Naira as displayed on the table 4.0. This sales estimated could serve as a re-assurance to the operators of the rubber company.

Profitability and Viability Analysis

At this juncture it is proper to introduce some profitability measures to actually evaluate the operations of Delta Rubber Company Limited for proper understating of the true position of the Assets and Liabilities, including the owner's equity. The study took a look at the Balance sheet. And also it is proper to consider the profit and loss account/income statement of the company for the years under review. Hence the Net Present Value (NPV) the Benefit cost ratio (BCR) the Internal Rate of Returns (IRR) as well as the Net current Ratio (NCR) Retuen on assets (ROA) and current capital Ratio (CCR) are calculated.

Table 5.0 Showed Delta Rubber Company Balance Sheet as at 31/12/ 2001

Delta Rubber Company LTD. Balance Sheet as At 31/12 2001			
SCHEDULE	VALUE (N)	SCHEDULE	VALUE (N)
<u>ASSETS</u>		<u>LIABILITIES</u>	
Fixed Assets	40,040,535		
Building Under Construction		CURRENT LIABILITIES	
	1,391,024	Creditor	39,808,688
	41,431,559	Provision for Tax	2,698,340
Current Assets:		Proposed dividend:	-
Stocks	8,596,356		
Debtors	7,352,022		
Bank & Cash Bal.	18,227,903		
	34,176,281		42,507,028
TOTAL =	75,607,840	NET WORTH	33,100,812
			<u>75,607,840</u>

Source: Delta Rubber Company Ltd. Annual Report 2001

Percentage Return on Assets	=	114.7%
Current Capital Ratio (CCR)	=	0.804
Net Capital Ratio (NCR)	=	1.78

Table 6.0. Showed Delta Rubber Company Balance Sheet as at 31/12/ 2002

Delta Rubber Company LTD. Balance Sheet as At 31/12 2002			
SCHEDULE	VALUE (N)	SCHEDULE	VALUE (N)
<u>ASSETS</u>		<u>LIABILITIES</u>	
Fixed Assets	55,570,843	CURRENT LIABILITIES	
Building Under Construction		Creditor	21,064,155
	<u>5,323,022</u>	Provision for Tax	2,698,340
	60,893,865	Proposed dividend:	-
Current Assets:			
Stocks	9,957,790		
Debtors	18,375,503		
Bank & Cash Bal.	<u>2,147,123</u>		
	34,176,281		23,762,495
TOTAL =	<u>91,372,281</u>	NET WORTH	67,609,786
			<u>91,372,281</u>

Source: Delta Rubber Company Ltd. Annual Report 2002

Percentage Return on Assets = 89.7%

Current Capital Ratio (CCR) = 1.28

Net Capital Ratio (NCR) = 3.85

Table 7.0. Showed Delta Rubber Company Balance Sheet as at 31/12/ 2003

Delta Rubber Company LTD. Balance Sheet as At 31/12 2003			
SCHEDULE	VALUE (N)	SCHEDULE	VALUE (N)
<u>ASSETS</u>		<u>LIABILITIES</u>	
Fixed Assets	58,570,384	CURRENT LIABILITIES	
Building Under Construction		Creditor	25,056,405
	<u>6,233,584</u>	Provision for Tax	2,698,340
	64,938,968	Proposed dividend:	-
Current Assets:			
Stocks	12,123,384		
Debtors	25,333,305		
Bank & Cash Bal.	<u>5,741,321</u>		
	43,197,617		27,754,745
TOTAL =	<u>108,136,585</u>	NET WORTH	80,381,840
			<u>108,136,585</u>

Source: Delta Rubber Company Ltd. Annual Report 2003

Percentage Return on Assets = 84.37%

Current Capital Ratio (CCR) = 1.56

Net Capital Ratio (NCR) = 3.89

Table 8.0 Showed Delta Rubber Company Balance Sheet as at 31/12/ 2004

Delta Rubber Company LTD. Balance Sheet as At 31/12 2004			
SCHEDULE	VALUE (N)	SCHEDULE	VALUE (N)
<u>ASSETS</u>		<u>LIABILITIES</u>	
Fixed Assets	60,070,000	CURRENT LIABILITIES	
Building Under Construction		Creditor	20,550,000
	<u>6,500,000</u>	Provision for Tax	2,698,340
	66,570,000	Proposed dividend:	-
Current Assets:			
Stocks	8,025,000		
Debtors	20,385,700		
Bank & Cash Bal.	<u>4,947,321</u>		
	33,358,021		22,898,340
TOTAL =	<u>22,928,021</u>	NET WORTH	77,028,021
			<u>99,928,021</u>

Source: Delta Rubber Company Ltd. Annual Report 2004

Percentage Return on Assets = 77.4%

Current Capital Ratio (CCR) = 1.45

Net Capital Ratio (NCR) = 4.36

A consideration of the Balance sheet of the company for the years 1996-1999 as shown in tables 5.0 to 8.0, The table showed that in the year 2001 the percentage Return on Assets was very high with 114.7%, this was due to the fact that the various machineries and equipment were all efficient and there were less depreciations but in the subsequent years depreciation on assets increased and this results to a gradual reduction in Percentage Return on Assets to be least in 2004 with 77.4%. On the other hand current Capital Ratio (CCR) and Net Capital Ratio (NCR) were all rising. This was so because the overall assets of the company had increased and company stock was rising. In 2001 the Net Capital Ratio (NCR) was 1.7%, this rose considerable to 4.36% in the year 2004 this was due to the reduction in the liabilities of the company from about Forty Two Million naira in 2001 about twenty two million naira in 2004. Also the value of fixed assets increased from about Forty One Million naira in 2001 to about sixty million in 2004. With this result it means that, for every naira invested on the project, the company covers cost and makes profit or about (N1.40) on each naira spent. This is a positive sign that the project is viable. According to Adegeye *et al* (1985), if the Current Capital Ratio (CCR) and the Net Capital ratio (NCR) are greater than 1, (CCR>1), (NCR>1), then accept project as profitable, therefore we at this point conclude that the Delta Rubber company project is profitable. The relationship between total cost (TC) and total revenue (TR) and the profit range for the different years 2001-2004 could be seen in Table 9.0 and fig. 1.0 that follows;

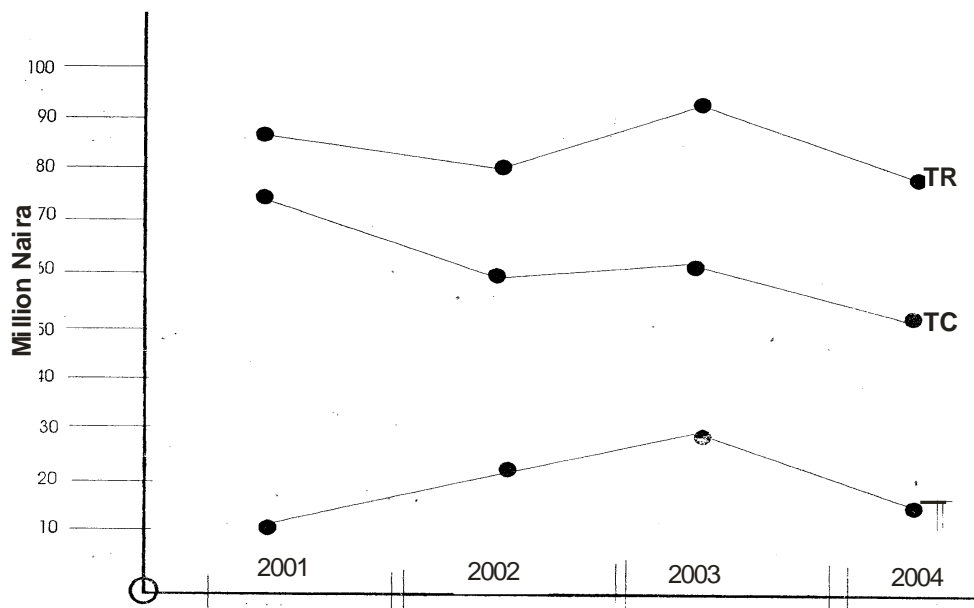
Table 9.0 Delta Rubber Company Profit Range for 2001-2004

Years	Total Revenue (TR)	Total Cost (TC)	Profits
1996	86,717,146	74,809,632	11,907,514
1997	81,815,721	61,141,140	20,667,581
1998	91,234,344	61,885,299	29,349,045
1999	77,566,722	56,605,065	20,961,657
Total	337,333,933	254,447,877	82,885,897

Source: Field survey 2005.

Figure 1.0 Graph Showing Total Revenue

TR. Total Cost (TC) and Profit Margin



Key: TR = Total Revenue
TC = Total Cost

From the above graph it is seen that in the first year 2001, the Total Revenue (TR) was slightly above the Total cost (TC), the fact that (TR) was above (TC) shows that the company was making profit in that year. But in the next year 2002, the margin became wider as the Total Cost (TC) began to drop sharply indicating increasing profit. In 2003 there was an increase in output resulting to a rise in Total Revenue (TR) very high above Total cost (TC). this relationship resulted to a very high profit margin for that year. In 2004, total output dropped drastically due to the seizure of one of the company's estate at Ubima/Elele by the youths of the host community, the reduction in out affected Total Revenue (TR), this could be seen in the figure 1.0 above.

Further evaluation based on other statistical tools is as follows:

(I) NET PRESENT VALUE (NPV)

NPV at 15% Discount Factor (Interest rate) =	6,114,520.8
NPV at 30% Discount Factor (Interest rate) =	63,914.6
NPV at 40% Discount Factor (Interest rate) =	180,528.8

Rule: Accept Project as viable if (NPV) is positive

Decision: Where as our NPV at different interest rates of 15%, 30% and 40% were positive, we therefore accept that the Delta, Rubber company project was viable within these period.

II) BENEFIT COST RATIO (BCR)

BCR at 20% Interest rate -	1.31%
BCR at 30% Interest rate -	1.03%
BCR at 40% Interest rate -	1.27%

Rule: Accept project as profitable if the Benefit Cost Ratio (BCR) is positive and greater than 1

Decision: Where as our BCR at 20% is 1.131%, BCR at 30% = 1.03% and at 40% 1.27% which are all greater than 1, (BCR>1) we therefore declare that the company's operation is profitable within the period under study

iii) INTERNAL RATE OF RETURNS (IRR)

Given the cost, Revenue and incremental benefit as shown in Table 4.11, we can calculate the (IRR) at different interest rates as follows.

Therefore,	IRR at 15% and 30%	=	28.6%
	IRR at 25% and 40%	=	39.3%
	IRR at 30% and 40%	=	37.8%
	IRR at 40% and 50%	=	48.6%

Rule: Accept project as valuable if the (IRR) is higher than the interest rates.

Decision: Following the data and the result of the IRR at different interest rates, it reported

That at the various Bank rates used, the IRR were all higher and above the least Bank rates. This implies that if the company had borrowed money to invest in the business in the end, they could still break-even (cover cost) and make some profit on any naira invested on the business. With this results the profitability of investment in Delta Rubber Company Limited within the period of study was not in doubt, and one will not hesitate to encourage more investment in the company (see Appendix for the computation of NPV, BCR and (IRR)).

IV. CONCLUSION

The results from this study shows that, based on several financial ratios and evaluation/analytical tools adopted, Delta Rubber Company Limited maintain a positive balance sheet. Investment in this company has been viable and profitable.

* Net Present Value (NPV) at different rates of 15%, 30% and 40% were all positive.

* Benefit Cost Ratio (BCR) at various interest rates of 20%, 30% and 40% were all positive and greater than 1 (BCR> 1), therefore, BCR at various rates were greater than 1 (BCR>1). We declare that Rubber production and processing by Delta Rubber Company Limited for the period under review is profitable.

Internal Rate Returns (IRR). The results shows that IRR were all higher and above the least Bank rates. Therefore, the business is viable. Which implies that if the company had borrowed money to invest, at the end they could still break-even (Cover-cost) and make some profit.

On the other hand, the Net Capital Ratio (NCR)and Current Capita Ratio (CCR) indicated positive increments. This finding supports earlier facts established by Chaudhry (1996) and Fubara (1981), who opined that investment in Delta Rubber Company Limited is a worth-while venture. Therefore regardless of the Craze for synthetic rubber as a cheap substitute, National rubber production and processing is still a profitable venture. Infact, Agbolagba (2003) had since identified existing International Market for our Local rubber products.

V. RECOMMENDATIONS

There is need for the company to expand its scope of operation to meet export grade crumb which will attract foreign exchange earnings, the State and the country at large.

Efforts should be stepped up to ensure that the crumb rubber processing plant operates at the normal capacity, by way of increasing factory capacity utilization to about 95-100%.

Appropriate measure should be put in place to minimize waste.

Operators should be encouraged through viable government policies and support to enhance diversification.

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