

*Full Length Research Paper*

# Structure, conduct and performance of farm gate marketing of natural rubber in Edo and Delta States, Nigeria

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**The study examined the structure, conduct and performance of farm gate marketing of natural rubber in Edo and Delta States of Nigeria. Copies of questionnaires were used on 75 randomly selected rubber farmers. Data collected were analyzed using Gini coefficient and budgetary technique. The results indicated that gross margin and net profit were ₦17,821.31 and ₦17,278.47 while the gross margin and net profit per farmer were ₦62,588.47 and ₦60,682.00 respectively. The marketing margin and efficiency were 44.03 and 122% respectively. Rate of return was also high. The Gini coefficient analysis showed that the market was concentrated (0.256), showing the possibility of non-competitive behaviour and equality in earnings among marketers.**

**Key words:** Gini coefficient, farm gate, marketing, budgetary technique, Nigeria.

## INTRODUCTION

Expansion of markets for natural rubber latex encouraged introduction and wide scale adoption of *Heavea brasiliensis* which proved to be a superior variety in terms of volume and quality of latex yield and regenerative capability. Production statistics show that Nigeria has a total of 247,100 ha of land under rubber cultivation. Of this figure, 200,100 ha are owned by small scale farmers while the remaining 47,000 ha are by estates (Aigbekaen et al., 2000; Delabarre and Serier, 2000). Unselected or local clones of rubber has yield of 300 to 400 kg ha<sup>-1</sup> per year of dry rubber while Rubber Research Institute of Nigeria (RRIN) adapted exotic clones and RRIN developed clones having latex yield of 900 to 1600 kg ha<sup>-1</sup> per year of dry rubber and 2000 to 3000 kg ha<sup>-1</sup> per year respectively (Omokhafa and Nasiru, 2004). Yield increase in rubber is obtained through the introduction of clone rubber tree instead of traditional seedlings with low yield potentials (Williams et al., 2001). The Nigerian rubber industry is a major employer of labour and foreign exchange earner for the country (Abolagba et al., 2003).

Agricultural marketing can be assessed or measured to

determine their efficiency in the areas of marketing structure and performance, market efficiency, marketing margin and market channels. Olukosi et al. (2005) defined market structure as those characteristics of an organization of a market which seem to influence strategically the nature of competition and pricing within the market. Market structure refers to certain characteristics of the market which are believed to influence its nature of competition and price formation (Adegeye and Dittoh, 1985). They further emphasized the characteristics to include size and number of buyers and sellers ensuring an adequate intensity of price and quality competition, freedom of entry and exit and adequate size of sellers so as to encourage increased investment. Before a marketing system is said to be good, the structure, conduct and performance must be critically be examined. This structure, conduct and performance have been widely used in agricultural marketing studies (Harris, 1982; Okunmadewa, 1990; Onu, 1997).

Market performance is the assessment of how well the process of marketing is carried out and how successfully its aims are accomplished. It is concerned with technological progressiveness, growth orientation of agricultural firms, efficiency of resource use and product improvement and maximum market services at the least

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possible cost. In other words, market performance is the appraisal of the extent to which the interactions of buyers and sellers in a market stimulate result that is consistent with social purposes (Adegeye and Dittoh, 1985; Olukosi et al., 2005). Tweelen (1997) reported that market performance is a reflection of the impact of structure and conduct on product price, costs and volume and quality of output. Onu and Okunmadewa (2001) stated that market performance includes the relative efficiency of production (that is, price relative to the average cost of production).

Marketing efficiency is defined as the maximization of ratio of output to input in marketing. The marketing inputs are the costs of providing marketing services while outputs are the benefits or satisfaction created or value added to the commodity as it passes through the marketing system. Marketing efficiency can also be defined as the movement of crops and livestock from producers to consumers at the lowest cost consistent with the provision of services consumer desires (Adekanye, 1988; Okunmadewa, 1990; Ejiola, 2001). Markets are efficient when the ratio of the values of output to the value of input throughout the marketing system is maximized. The higher the ratio, the greater the marketing efficiency is considered to be (Tweelen, 1997; Arene, 1998).

Marketing margin is defined as the difference between purchase and sale prices (Ejiga, 1979; Tomek and Robinson, 1981). Olukosi et al. (2005) viewed marketing margin as the difference in price of a given commodity as it moves from the primary producer to the ultimate consumer while Adegeye and Dittoh (1985) stated that market margin is the representation of the difference in price paid to the first seller and that paid by the buyers. Man earns a sort of margin for the duties performed in the marketing channel. The size of the margin is sometimes influenced by the degree of processing of the commodity in question, its bulk and unit values and perishability.

Researches conducted on the marketing of natural rubber indicated a number of factors such as poor prices, deliberate sharp practices as addition of debris, sands by farmers and world prices that affected production and sales in many rubber producing countries (Abolagba et al., 2003). However many of such studies were conducted without recourse to the small scale farmers who sold at the farm gate. The study was conducted to analyze farm gate marketing of natural rubber among small scale rubber farmers in Edo and Delta States of Nigeria with the specific objectives of estimating cost and return from rubber marketing, examine market structure, marketing margin and efficiency.

## METHODOLOGY

Multi stage, purposive and random sampling procedures were adopted for the study. Stage one was the purposive selection of Edo and Delta States. The study area is one of the major rubber-

growing belts of Nigeria (Abolagba et al., 2003). Stage two was the selection of rubber growing local government areas of the States (Uhumwode, Ovia North East and Ovia South West in Edo State) and Ika North East in Delta State. The third stage was the random sampling of 100 farmers involved in rubber cultivation from the 12 villages randomly selected in the local government areas. Out of the 100 respondents with interview schedule, 75 were used for analysis. Data collected were analyzed using budgeting technique, marketing margin analysis and Gini coefficient to determine the extent of producers (sellers) concentration and consequently the nature of competition.

The budgeting technique adopted for the study is the Gross margin and is stated thus:

$$\text{Gross margin (GM)} = \text{GI} - \text{TVC} \quad (1)$$

Where: GM = Gross margin, GI = gross income, TVC = total variable cost.

$$\text{NP} = \text{GM} - \text{TFC} \quad (2)$$

Where: NP = Net profit, TFC = total fixed cost. Mathematically, the Gini coefficient is expressed as follows:

$$\text{GC} = 1 - \sum XY \quad (\text{Iheanacho, 2005}). \quad (3)$$

Where:

GC = Gini coefficient

X = proportion of sellers

Y = cumulative proportion of sellers

$\Sigma$  = summation sign

The value of GC ranges from 0 to 1. The higher the coefficient, the higher the level of concentration and consequently high inefficiency in the market structure and vice versa.

$$\text{MM} = \frac{\text{FP} - \text{CP}}{\text{CP}} * 100 \quad (4)$$

Where:

MM = Market margin,

FP = Farm gate price

CP = Consumer price

Marketing efficiency (ME): Shepherd-Futrel model is adopted and depicted as:

$$\text{TR/TC} \times 100/1 \quad (5)$$

Where: TR = total revenue from sales of coagula; TC = total cost. Shepherd-Futrel model of accurate measurement of efficiency gives the productivity of resources invested in the marketing process in quantitative terms either by the total value of products sold divided by computing the total estimated cost incurred by marketing agency and producers combined and expressed as a percentage or alternatively, the coefficient of marketing efficiency can be expressed as the difference between total sales revenue and total cost divided by total cost incurred (Arene, 1998).

## RESULTS AND DISCUSSION

### Market structure

Analysis of sellers' concentration for rubber showed that the Gini coefficient as computed from Table 1 is 0.256 and very low. The closeness of the coefficient to unity

**Table 1.** Market structure analysis for natural rubber.

Annual sales (₦)	No of farmers	Proportion of sellers (X)	Cumulative proportion of sellers	Annual sales (₦)	Proportion of cumulative total sales(Y)	XY
≤ 200,000	69	0.92	0.92	3,937,140	0.80	0.736
200,000 - 800,000	3	0.04	0.96	675,000	0.14	0.006
>800,000	3	0.04	1.00	312,000	0.06	0.002
Total	75			4,924,140		$\sum XY = 0.744$

Source: Data analysis, 2009.

**Table 2.** Average market margin, cost and returns of natural rubber.

Item	Value	Percentage of cost
<b>Per hectare analysis</b>		
Total revenue (TR) (₦)	18,694.53	61.67
Total variable cost (TVC) (₦)	873.22	38.33
Total fixed cost (TFC) (₦)	542.84	
Total cost (TC) (₦)	1416.06	
Gross margin	17,821.31	
Net profit	17,278.47	
Marketing margin (%)	44.03	
Marketing efficiency (%)	122	
Rate of return (ROR) (%)	132	
<b>Per farmer analysis</b>		
TVC (₦)	3,066.73	
Fixed cost	1,906.47	
TC (₦)	4,973.20	
TR (₦)	65,655.47	
GM (TR – TVC) (₦)	62,588.47	
Net profit (₦)	60,682.00	

Source: Data analysis, 2009.

indicates the existence of non-competitive behaviours such as collusion and inequality in earning. Farm gate marketing in the study area is near perfection and characterized by equality in earning. Variation in earning from rubber is minimal as most farmers dispose their produce to Michelin. Inequality in earning is a partial reflection of differences in the risk of investment (Iheanacho, 2005). People differ in their risk preference and this affects their earning. Those with a higher propensity to take risk tend to choose more risky ventures and consequently, could have larger earnings and make more profits. Conversely, people with a relatively high degree of risk aversion seem to prefer less risky and less profitable investment and consequently, obtain lower earning (Olukosi et al., 2005). Profits in natural rubber business are known to be affected by price volatility in the world market and seasonality of the rains that disrupt tapping and other production operations.

## Market performance

### Market margins, cost and returns

Analysis of farm gate marketing of natural rubber indicates that the marketing margin per hectare was 44.03% (Table 2). This implies that farm gate marketers reaped 44.03% of the final price offered per hectare. This is high relative to the prevailing deposit interest rate of 5 – 10% in the banks. In a perfectly competitive market, the marketing margin on the average, and in the long run is expected to be equal to the cost of capital with competitive return to labour, management or risk. The high market margin is a reflection of imperfectly competitive market condition, which is detrimental to retailers as pointed out by Scheid and Sutinen (1981).

$$GC = 1 - \sum XY = 1 - 0.744 = 0.256.$$

Analysis of marketing cost per hectare of dry rubber is also indicated in Table 2. The gross margin is high and could be attributed to favourable price of natural rubber in the world, which could have positive effects on producers. Abolagba et al. (2003) and Schroth et al. (2004) pointed out the profitability of natural rubber is affected by world price of the commodity and weather conditions. Marketing efficiency was 1.22 while rate of return (ROR) was 1.32. Both indicators can be multiplied by 100 to convert them to percentage. The rate of return to investment can be compared with lending rate which stood at 20 - 22% to determine the desirability of the venture. Rate of return is usually the undiscounted cost benefit ratio of a project. The marketing efficiency is similar to rate of return on investment (RORI) and is greater than bank lending rate implying that farm gate marketing is profitable. This also supports viability and profitability.

## Conclusion

Farm gate marketing in the study area showed both high and gross margins of ₦17,821.31. The market depicted non-competitive practices and near equality in earnings. It is thus recommended that rubber farmers should organize themselves into cooperatives to enable them reap the benefits of scale economy in areas of product transportation and storage. This would also help them to benefit from credit facilities from agricultural and commercial banks and other micro credit financial institutions.

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