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Full Length Research Paper

Market Strategies and Storage Solutions for Palm Oil in Imo State: An Economic Perspective

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The major objective of the study is to determine the profitability or otherwise of palm oil storage and marketing among the people of Imo state of Nigeria. Data for the study were collected by the use of questionnaire purposively distributed among the respondents who processed palm oil stored and marketed by themselves and those who do not process the same. These data were analyzed using descriptive statistics and gross margin analysis to determine the costs and return of palm oil from the processing and storage points to the various marketing outlets. Socio-economic characteristics of the respondents showed that the non-processors of palm oil stored and marketed acquired more education than the processors while majority of the marketers are 50 years and above. The results of this study further showed that the average gross marketing margin per drum of palm oil under storage was N6,164.64k for respondents processing their own oil for storage and N5,345.33k for respondents who do not process their own palm oil (that is, who purchased, stored and marketed palm oil). The best periods to buy and sell palm oil stored were found to be within the months of March and September respectively. The result further concluded that the hypothesis that there is no significant difference in the net returns of palm oil resulting from its storage is significant at 1% level. On the basis of the findings, the study recommends that processors of palm oil stored and market should acquire formal education in other to boost their profit level and government to provide incentives such as modern method of processing palm oil to encourage youths into the business.

Key words: Marketing, palm oil, storage and processing.

INTRODUCTION

The discovery of petroleum in the late 50's and its exploitation and export in the early 70's changed the economic scenario in favour of oil as the chief revenue earner for the nation. Nigeria started to move from agrarian economy to a developing industrial nation and during this time, import substitution policy held sway. The global economic recession of the mid- 80's however, exposed the inherent structural weakness of import substitution as a strategy for industrialization. With the coming of the Structural Adjustment Programme (SAP) in 1986 and the concomitant devaluation of the naira, Nigerian manufacturers found it difficult to import the needed raw materials and machinery to produce profitably. Nigeria is now diversifying its economic resources and efforts are being intensified to revamp the agricultural sector once again in order to achieve sustainable economic development. It is in line with this that research into palm oil as major commodity considered for the purpose of the project to provide comprehensive information in the area of marketing spurred this study.

In Nigeria, palm oil marketing is concerned with all stages of operation that aids movement from the producers to the final consumer. These include: assemblage, storage, transportation, grading and financing. Marketing of palm oil in Nigeria takes place in homes of the processors, road sides, local/periodic market centres and stalls. These can be both wholesale and retail types in both rural and urban markets.

The export oriented nature of palm oil has enabled many developing countries like Nigeria establish marketing boards to regulate the prices of palm oil in the early days such as Nigeria Palm Produce Marketing Board (NPPMB) in 1949. The board handled the purchases and export

Table 1. Local prices of palm oil and kernel (Average N/Ton).

Year	Crude Palm Oil	Palm Kernel
1999	60,000	18,000
2000	63,000	18,000
2001	60,000	20,000
2002	75,000	23,000
2003	90,000	23,000
2004	1000,000	23,000

Source: Osan Survey (1993); RMRDC (2008).

Table 2. International price of palm oil and palm kernel.

Year	Average USD/ton		Average N1USD	Average N/ton	
	CPO	PKO		CPO	PKO
1999	436	694	92.34	40,260.24	64,083.96
2000	310	444	101.65	31,511.50	45,132.6
2001	289.5	307.5	111.90	32,395.09	34,409.29
2002	390	416	120.97	47,178.30	50,323.52
2003	443	459	129.36	57,306.46	59,376.24
2004	437.5	-	131.84	57,680	-

Source: Oil World.

of palm oil and other palm products. In 1977, NPPMB was scrapped and replaced with Nigeria Palm Produce Board (NPPB) and unlike the predecessor, its national scope changed with the responsibility for internal marketing, export, sales, shipment and provision of information for research. The board was abrogated in 1986 because of inefficiencies and to give way to Structural Adjustment Programme (SAP).

Price of palm oil is largely affected by production or output of the palm oil within the year and general inflation (Fry, 2003). The current annual demand for palm oil alone is in excess of 1 million tons. With domestic production at 785,000 MT there is thus a production deficit. One manufacturing company alone can process the volume of oil and there are over 30 companies with vegetable oil refineries and soap production plants.

In response to the production in Nigeria and increasing demand, there has been some increase in private sector investment in the development of new oil palm plantation and the expansion of existing ones. In addition to the large plantations, smallholdings and out grower's schemes are being promoted by the Federal and State Governments. Tables 1 and 2 confirm the fluctuation in world price of palm oil from which reflects the unsteady prices witnessed in the country from year to year.

The local prices of palm oil and kernel are shown in Table 1 for 1999 to 2004. The International Market prices for the corresponding years is shown in Table 2. While the prices of crude palm oil on the international market dipped from 1999 to 2001, the local prices held steady for the period. From 2001, the prices have been on the increase on both the local and international markets. The palm kernel/kernel oil prices have followed the same trend for palm oil. Current price of palm oil in Nigeria is about ₦100,000 (USD 758) per metric ton while current international price is USD 438 (N57,816) Rotterdam (Tables 3 and 4). Clearly the local prices are about double the international prices.

After processing palm oil, the next thing is to distribute to place(s) where the commodity is needed. This is accomplished through packaging and transportation to the destinations. A good place to start is the market because this is where majority of Nigerians shop for their food. Smaller pack e.g. bottle and gallons are dispensed on the spot from larger containers like tins and drums[1].

Distribution and marketing of agricultural products are as essential as the product itself (FAO, 1997). Though palm oil is produced in Southern Nigeria, it needs to be evenly and efficiently distributed if it must serve the needs of the greater population. For instance, in a consumer survey of Western Nigeria, both quantitative

[1] The buyer brings in his container and pays for the content only. These pack sizes are usually household size. The larger pack sizes of 18 litre tins are sold with the container, while the drum is not. The buyer bringing his drum to turn from the seller's into his. Alternatively, buyer may pay a deposit for a drum and return it latter for refund.

Table 3. Costs and return to palm oil marketing per drum for processors of palm oil.

Areas	Average marketing cost (₦)	Revenue from sales of by- products (₦)			Total revenue (₦)	Average gross marketing margin (₦)
		Sales of palm oil	Sales of fibre	Sales of palm kernel		
Okigwe zone	20,202	23,733	450	2466	26,450	6248
Okigwe	19,950	23,000	350	2600	25,950	6000
Onuimo	22,626	24,600	600	2500	27,700	5074
Isiala Mbano	18041	23,600	400	2300	25,700	7659
Orlu Zone	20,524	24,222	2600	316	27,138	6614
Orlu	20,880	24,000	2300	400	26700	5820
Oru East	21,129	24,500	3000	250	27750	6621
Njaba	19,564	24,166	2500	300	26966	7402
Owerri zone	21,666	23,400	2631	266	26298	4632
Owerri Mun.	20,018	23,000	2645	200	25845	5827
Owerri West	19,995	23,700	2650	350	26700	6705
Ohaji/Egbem	21,987	23,500	2600	250	26350	4363

Source: Field Survey (2010).

Table 4. Costs and return to palm oil storage and marketing per drum of non- processors of palm oil stored and marketed.

Areas	Average marketing cost (₦)	Rev. from sales of palm oil after storage	Average gross marketing margin (₦)/drum
Okigwe zone	19547	25003	5456
Okigwe	20548	24110	3562
Onuimo	19379	27200	7821
Isiala mbano	18716	23700	4984
Orlu Zone	**18580**	**23400**	**4820**
Orlu zone	18370	23833	5463
Oru East	18780	24100	5320
Njaba	17750	24000	6250
Owerri Zone	18473	23600	5127
Owerri Mun.	18900	24200	5300
Owerri west	18570	23600	5030
Ohaji Egbema	17950	23000	5050

Source: Field Survey (2010).

and qualitative deficiencies in protein intake were reported (Udoh and Umoh, 2005), and the study identified among others, inefficient distribution as being responsible for this situation.

Past policies have aimed at increasing agricultural productivity through increased investment in agronomic and production systems research. Efforts have also been made to restructure the agricultural sector by removing every element of control in the supply and pricing of agricultural produce through the abolition of marketing boards, and reducing level of subsidies on agricultural inputs. This latter policy has contributed enormously to the erratic price variations in agricultural product observed in recent times (Okoh and Akintola, 2005). Not much emphasis has been placed on evaluation and development of marketing system in agriculture. Policy formulation has therefore failed to take cognizance of the fact that production and marketing constitute a continuum and that the absence of development in one retards progress in the other (Olayemi, 1972).

Because of the increased demand for palm oil resulting from an increase in population and income growth, relative to the low productivity of the oil palm sector, Nigeria has become a net importer of palm oil. At the same time, the rapid devaluation of the Naira combined with high transportation costs from ports to internal markets put imported oil in a competitively disadvantaged position. Thus Nigeria's first goal is to meet the domestic demand and then if possible seeks to become competitive in export markets. Nigerian palm oil production is potentially competitive in the domestics market if oil palm industry would enhance the overall economic development through the income and employment effects in the rural and urban economies (Olagunju, 2008).

Previous studies on the marketing and pricing of food stuffs in different parts of Nigeria have concluded that the marketing and pricing information transmission mechanism are inefficient although there are many buyers and sellers in the market (Dittoh, 1994). The paucity of physical infrastructure such as storage facilities, transportation system, access to roads, communication channels and inadequacy of economic data for planning and research are some of factors identified as source of this inefficiency. Other factors include: a high level of intermediaries in the marketing/distribution chain, high concentration of food stuff marketing at wholesale level as well as high erratic prices which will further depress the level of agricultural production (Okoh, 2005; Afolami et al., 2000; Tijani and Ajobo, 1997).

The oil palm sub- sector of the agricultural sector of the economy presented itself as a potential productive sector that could be used to diversify the economy after years of neglect. Historically, this subsector has been a source of growth in a stagnant economy because of the numerous economic potentials of the oil palm (Purvis, 1970). Ahmed (2001) highlighted the importance of the economic tree crop in providing direct employment to about 4 million Nigeria people in about 20 oil palm growing states in Nigeria and indirectly to other numerous people involved in processing and marketing. Omoti (2001) stated that Nigeria has enormous potential to increase her production of palm oil and palm kernel primarily through application of improved processing techniques and marketing. Ehirim (2004) estimated the net profit level of palm oil marketers to be as high (38%) and the marketing efficiency index of 1.87 which implied that the level of satisfaction derived in consuming a unit volume of palm oil at a reduced cost was high and Olagunju (2008) stressed that profitability analysis of processing techniques in palm oil industry in Nigeria was profitable.

Kei et al. (1997) highlighted that the stagnation in the oil palm sector in Nigeria was influenced by the overall agricultural policies that could be classified into three periods visa, namely, the independence (1960-1970), the oil export boom period (1970-1985), the appreciation of the Naira and the reduction of duties on food imports made food imports cheaper than domestic staples. These actions created biases against agricultural exports (Forest, 1993). During the sap period (1993-2003) on the positive side there was a rise in output prices, improvement in production efficiency and on an increase, in opportunities for small business enterprises. On the negative side however, it led to increased input prices and a sharp increase in the cost of living relative to nominal income (CBN/NISER, 1992) so, national-level consumption has declined following sap implementation. Kei et al. (1997) in their study observed that because of the increased demand for oil palm products, resulting from an increase in population and income growth, relative to the low productivity of the oil palm sector, Nigeria has become a net importer of palm oil. At the same time, the rapid devaluation of the Naira combined with the high transportation costs from ports to internal markets put imported oil in a competitively disadvantage position. Based on these premises, the present study seeks to answer the following questions.

1. What is the cost of performing marketing activities in palm oil industry in the study area?
2. What is the return to palm oil storage and marketing?
3. What is the profit realisable from palm oil marketing in the study area?

METHODOLOGY

The study area

Imo state is located in the South – Eastern area of Nigeria and shares boundaries with Anambra, Abia, Delta and Rivers states. The state has a total land area of about 19,000 square kilometers and a population of about 3.78million (NPC, 2006) out of the country's 927,623 Km^2 and 140 million population respectively. The people of the state are mostly rural which makes their occupational distribution tilted towards agricultural production. The climate is of two types: the dry and wet seasons with intervening cold and dry harmattan period usually experienced during December and January. The state has an annual rainfall ranges from 2000 to 2500 mm, while maximum average temperature ranges between 30 to 35 degrees centigrade (Imo ADP, 2009). With this climatic pattern and few sizeable expanse of arable land due to high population density, the farmers in the area grow crops like yam, cassava, maize, fruits and vegetable among some cash crops like oil palm, coconut and plantain. Hence, there are a total of 303,333 farm families involved in agricultural production in the state.

Sample selection

In order to get a representative sample and to achieve the objectives of the study, the sample design was based on Imo state Agricultural Development Project's (Imo ADP's) zoning of the state's 27 local government areas into 3 zones in consonance with ecological characteristics and cultural practices. The zones are Owerri, Orlu and Okigwe. The sampling frame for palm oil storage activities across the state, both in the local government areas and villages determine the spread of people involved in palm oil storage and marketing in the state. The sampling frame was used to determine the nature of each respondent entrepreneur whether

urban or rural based.

Multi-stage sampling technique was used to draw samples of this study. The three zones were selected and three local government areas (L.G.As) each from the zones were purposively selected based on their record for oil palm production. The second stage is selection three villages out of the selected L.G.As. and the last stage involved random selection of respondents who stored and marketed palm oil in the area. The list of palm oil marketers kept by Agricultural Development Project in Imo state of respondents who stored more than 1 drum of palm oil in the year 2010 formed the sampling unit of this study. The questionnaire method was used to collect information from the respondent augmented by personal observation. Variables on which data were collected included: respondent's socio-economic characteristics, profitability of palm oil enterprise and period of storage and sales of palm oil for highest returns. The study therefore covered three zones of the state, 9 local government area, 27 villages and 108 respondents.

Sources of data

The data required for the study involved both primary and secondary types. Only information relevant to the afore-mentioned objectives of the study were sought and collected. The secondary data/information was sourced from materials such as periodicals, journals articles and conference/workshop/seminar papers and statistical bulletins.

Data analysis

The tools of analysis employed for analyzing the study data have been descriptive statistics and gross margin analysis. The descriptive statistical tool comprised frequency counts, percentages, means and modes were used to analyze the socio- economic characteristics of the respondents. The gross marketing margin analysis was used to analyze the gross marketing margin per drum of respondents in the study area.

GMM= TR-TVC

Where GMM = Gross Marketing Margin (₦), TR = Total Revenue (₦), TVC =Total Variable Cost (₦)

But TVC = Cost price – marketing cost.

Hypothesis

When palm oil is kept in the store for a period of time before it is taken to the market for sale, some value has been added to make it attract higher price than when it is not stored. This added value is normally referred to as time value. To test the effect of storage on the palm oil before offering it to the market for sales, the following hypotheses were formulated and tested thus:

H**o**: there is no significant difference in the net returns to palm oil resulting from its storage.

H_1: there is significant difference in the net returns to palm oil resulting from its storage.

T – test statistics

The t – test statistics has been used to test the null hypothesis stated earlier.

$t = X_1 - X_2$

$= \delta\sqrt{N_1 + 1/N^2}$

Where,

$\delta = \sqrt{N_1 S_1^2 + N_2^2/N_1 + N_2 - 2)}$

But S^2 is the sample variance (the unbiased estimator of the population variance).

$$S^2 = \frac{(X_1 - \bar{X}_1)^2}{N-2}$$

Where t = calculated t – statistic, δ = population variance, X_1 = total gross margin, $\bar{X}$ = mean of variable 1, $\bar{X}_2$ = mean of variable 2, N_1 = population size of variable 1, N_2 = population size of variable 2, $N_1 + N_2 - 2$ = Degree of freedom, $N^2{}_1$and $S^2{}_2$ = Sample variance of variables 1 and 2 respectively.

RESULTS AND DISCUSSION

Table 2 shows the socio-economic characteristics of the respondents. Men dominate women in palm oil storage and marketing business. The respondents acquired one level of education or the other. 81.48% of the respondents processing the palm oil marketed were literates while 18.52% were illiterates. On the other hand, all the respondents among the non-processors of palm oil stored and marketed in the study area had formal education. The tasks performed by the processors do not require them to acquire education as a necessity. The non-processors mostly carry the product across the shores of the state and as such need to break language barrier. Majority of the respondents (about 77.77%) for both group are within the age group of 30-59 years. This age group is the most active and productive group of the population of any society. Few of the respondents are less than 30 years of age. Youth despise this kind of business because of its nature. It is a strenuous and tasking enterprise and its operation carried out under dirty environment which is the reason why youths don't normally want to be involved. The situation imposes great threat to the business as the older ones will not have younger people to replace them during retirement.

More than 85% of the respondents in each group are married with an average family size of 5. Years of experience by respondents in business ranges from less than one year to more than ten years.

Tables 3 and 4 reveal the costs and returns to palm oil marketing per drum of respondents who processed and who did not process by zones and local government areas. Orlu zone recorded the highest average gross marketing margin per drum of ₦6614 while Okigwe zone is the least with ₦6,248. However, Okigwe zone recorded

Table 5. Cost Items of storage per drum of palm oil.

Cost of storage	Processors (₦)	Non-processors (₦)
Palm oil / fruit	13,5000.00	14,800.00
Labour	250.00	120.00
Transportation	900.00	380.00
Rent	200.00	350.00
Levies	100.00	100.00
Cost of processing	2,500.00	-
Security/preservatives	100.00	150.00
Interest	1,535.83	1,383.50
Total	19,085.83	17,183,50

Source: Field Survey (2010).

Table 6. t-test comparison of net returns from storage of palm oil.

Variable	Category of resp.	Mean of var. x_1	Standard dev. S^2	Variance	t-cal.	Interpretation
X_1	Stored	8824.6	8615.1	5582.3	6.24	Significant
X_2	Not stored	2123.2	2342.8			

Source: Field Survey (2010).

the highest average gross marketing margin per drum than the rest of the zones under those who do not process the palm oil stored and marketed. In that case, Orlu and Okigwe zones performed better than Owerri due to lower cost of marketing recorded in performing the marketing functions. This confirms the assertions of Abbot and Makeham (1989); Abiodun et al. (2002); Adesida et al. (1986) and Trapp (1996) that reduction in marketing cost through efficient marketing enhances greater marketing margin.

Marketing margin is really made up of different marketing cost of performing marketing functions such as storage, transportation, processing and handling. Alternatively, it is made up of return to the different factors of production used in marketing (Adekanye, 1988). The only difference in the cost structure of the 2 categories of marketers is cost of processing which is second highest of the entire cost items of the enterprise.

Table 5 depicts cost items of storing and marketing one drum of palm oil. Total cost items for processors are larger in value than that of non processors (₦19,085.83 against ₦17,183.50). This is because much task is involved in processing which incurs cost too. Also the revenue per drum of palm oil is higher for processors due to aggregate sales of other products such as palm kernel, shell, fibre etc (Table 3). Even though the cost of storage and marketing per drum of palm oil is higher than the non-processors, their marketing margin is still higher than expected. Revenue from sales of the bye-products more than compensate for the increased cost of processing and storage. Interest was imputed into the storage cost for the length of time the product was in the store. An average rate of 8.75% interest was charged for storing 1 drum of palm oil for an average period of 6 months. Storage starts from the month of March to May and sales of stored product starts from August.

Hypotheses testing

The results of the t-test comparison of the net returns from the zones in the study area are presented in the Table 6. The net return from storage of palm oil is significantly different from the net return of palm oil not stored at 1% level of significant since the calculated t-value is greater than the t-tabulated.

Conclusion

From the results of the study, the following conclusion can be made. Storage and marketing of palm oil by the entrepreneurs is profitable. The result agreed with the work of Oluwatayo et al. (2002) who found out that an average palm oil marketing in Oyo state was lucrative. It also corroborates with the work of Adewumi and Omotesho (2002) that greater gross margin leads to profit maximization which is central objective of producers.

Illiteracy is common among the processors. The non-processors mostly carry the product across the shores of their state and as such need to break language barrier. Majority of the respondents are middle aged men and women. Average gross marketing margin per drum of palm oil of the respondents who process palm oil they stored and marketed is higher than those who do not process same by themselves. The hypothesis testing confirms this result. This confirms the argument that net returns resulting from storage of palm oil is more compared to when palm oil is not stored (Oluwatayo et al., 2002). On the basis of the findings, the study recommends that processors of palm oil stored and marketed should acquire formal education in other to boost their profit level and government to provide incentives such as modern method of processing palm oil to encourage youths into the business.

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Appendix

Table 1. Socio-economic characteristics of respondents.

Variables	Processors of palm oil stored and marketed		Non-processors of palm oil stored and marketed	
	Frequency	(%)	Frequency	(%)
A: Gender of the respondents				
Male	35	64.81	30	55.56
Female	19	35.19	24	44.44
Total	54	100	54	100
B : Level of education				
No education	10	18.52	0	0
Primary	30	55.55	10	18.52
Secondary	11	20.37	27	50.00
Higher Institution	3	5.56	17	31.48
Total	54	100	54	100
C : Age distribution of respondents				
< 30 Years	5	9.26	3	5.55
30-39	11	20.37	11	20.37
40-49	13	24.07	15	27.78
50-59	18	33.33	19	35.19
> 60	7	12.96	6	11.11
Total	54	100	54	100
D : Marital status of respondents				
Married	46	85.19	47	87.04
Single	8	14.81	3	5.55
Widowed	0	0	4	7.41
Total	54	100	54	100
E : Years of experience				
< 1	3	5.55	5	9.26
1-5	16	29.63	13	24.07
6-10	15	27.77	25	26.30
> 10	20	37.04	11	20.37
Total	54	100	54	100

Source: Field Survey, 2010.