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Palm Oil Marketing As Veritable Enterprise for Poverty Reduction and Women Empowerment in South South States of Nigeria

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ABSTRACT
The status of gender mainstreaming, profitability, determinants of profit, market structure, marketing efficiency and constraints to palm oil marketing by the intermediaries in the South-South states of Nigeria informed this study. Multistage and random sampling methods were used to select 200 marketers (50 wholesalers and 150 retailers) who were issued structured questionnaires to obtain primary data. Descriptive statistics, budgetary technique, Sherpherd-Futrell and multiple regression methods were used to analyze the data. Results indicated female dominance (84%) at the retail level and male dominance (62%) at the wholesale level while 76.6% of the respondents funded the business from personal savings. Gini coefficient indices of 0.341, 0.256 and 0.214 for producers/suppliers, wholesalers and retailers respectively reflected evidence of a fairly competitive market. Lowest monthly mean wholesale and retail marketing margins of ₦2,500 and ₦1,800 per 20litre jerry-can respectively were common in the markets. Marketing efficiency levels of 50.5% and 70.7% were attained by the wholesalers and retailers respectively. Net marketing income, return on investment, net return on investment and gross ratio of ₦6,216,100 and ₦4,109,400; 1.98 and1.42; 0.98 and 0.41; 0.51 and 0.71 for wholesalers and retailers respectively proved the business profitable at both levels. Type of intermediary, marketing cost and price of product statistically and significantly influenced net marketing income earned by the respondents while age, gender, marital status, household size, and marketing experience were not significant. Palm oil marketing in the area was majorly constrained by high cost of transportation, inadequate capital and poor sales for wholesalers; lack of access to capital, poor sales and high cost of transportation for retailers. Government and other development agencies should build new model markets, rebuild/expand old markets, and provide good road network so as to reduce cost of marketing, hence improve marketing efficiency and profit. The palm oil marketers especially women should form cooperatives in order to access cheap credit facilities, enjoy other benefits of cooperation and empower themselves.
Key words: Palm oil; Profitability; Women empowerment; South south; Nigeria.

INTRODUCTION

The agricultural sector was the backbone of the Nigerian economy until the late 1970's when hydrocarbon was discovered in commercial quantity in Oloibiri, present day Bayelsa State. It still holds the key to rural development, poverty alleviation and overall economic development of a nation (Oluwafemi, Fasakin, Adekola, Olatidoye, Obi, Ozor and Irumundomoh, 2010). Therefore, growth in the sector where most of the nation's work force is located is a must for poverty reduction and economic growth (Oluwafemi, 2009). The agricultural sector is therefore fundamental to cutting hunger and reduction of the burden of food import (Peacock, 2005). The sector remains vital to Nigeria's drive towards its

slated developmental goals as outlined in the Vision 20:2020. The sector contributed approximately 30% to the Gross Domestic Product (G.D.P) of Nigeria in 2014 and was one of the driving forces behind the economic growth experienced by the country (National Bureau of Statistics (N.B.S), 2014). It employs about 70% of the nation's population; and channeling part of this population to the processing of raw products presents a good potential for value addition and the growth of agro industries (United Nations Industrial Development Organization (UNIDO), 2011 as cited in Foundation for Partnership Initiatives in the Niger Delta (P.I.N.D), 2012).

Oil palm (*Elaeis guinensis*) originated from the tropical rain forest region of West Africa which runs through the Southern Latitudes of Ghana, Liberia, Nigeria, Cameroon, Togo, and into the equatorial region of Angola and the Congo. The oil palm friuts are used in commercial agriculture in the production of palm oil. The African oil palm (*Elaeis guinensis*) is native to West and Southwest Africa, occurring between Angola and Gambia (Mathew, 2009). West Africa used to be the centre of the palm oil industry. The export of it began in 1832 and by 1911 "British" West Africa company alone exported 157,000 tonnes of which about 75% came from Nigeria. In the 1870s, British administrators took the plant to Malaysia and in 1934 that country surpassed Nigeria as the largest exporter of the product(Carrere, 2013).

Mathew (2009) also identified the two varieties grown in Nigeria as Dura and Tenera. Dura is the common wild palm found all over Nigeria. The fruit has a thick shell and a large kernel. It gives a low amount of palm oil and begins to yield six to seven years after planting. Tenera has a thin shell and a small kernel. It produces a high quantity of palm oil. It bears fruit three to five years after planting and is therefore favoured by farmers for the development of new plantations.

World production of palm oil had increased tremendously during the last 30 years as a result of rapid expansion of oil palm planting in South East Asian countries spearheaded by Malaysia and Indonesia. Significant amounts of palm oil continue to be produced by the traditional producer countries in West Africa but the growth was much slower (Nwauwa, 2011). Olagunju (2008) puts the worldwide palm oil production during the 2005-2006 growing season at 39.8 million metric tonnes. It is by far the most widely produced tropical oil, and constitutes 30% of total edible production worldwide.

In Nigeria, oil palm is indigenous to the coastal plain having migrated inland as a staple crop. About 80% of production comes from dispersed small holders who harvest semi wild plants and use manual processing techniques. Several million smallholders are spread over an estimated area of 1.65 million hectares in the southern part of Nigeria. In addition to the agro climatic and structural factors (size and scale of production and processing sectors) there are other constraints to oil palm production like little use of modern inputs and extension services; low provisions of market information, standards and quality control. The estimate for oil palm plantations in Nigeria ranges from 169,000 hectares to 360,000 hectares of plantations (Carrere, 2013).

Indonesia with a figure of 33,000 metric tonnes is the leading world producer of palm oil, followed by Malaysia with 19,800 metric tonnes, Thailand, 2,000 metric tonnes and Colombia with 1,108 metric tonnes. Nigeria is the 5th largest producer of palm oil with 930 metric tonnes. Nigeria palm oil production has never met the domestic consumption since 1990. The level of production has remained static from 2012 (970 metric tonnes) to 2016, whereas consumption has been increasing steadily from 1455 metric tonnes in 2012 to 1520 metric tonnes in 2015 (U.S Department of Agriculture, 2016).

Olagunju (2008) reported that because of the increasing 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 palm

oil in a competitively disadvantaged position. Thus Nigeria's first goal is to meet the domestic demand and then if possible seek to become competitive in export markets. Nigeria palm oil production is potentially competitive in the domestic market if oil palm industry would enhance the overall economic development through the income and employment effects in the rural and urban economies.

The oil palm sub-sector of the agricultural sector of the economy presented itself as a potential source of growth in a stagnant economy because of the numerous economic potentials of the oil palm (Oluwatayo, Awoyemi and Sekumade, 2002). Ahmed (2001) highlighted the importance of oil palm in providing direct employment to about 4 million Nigerian people in about 20 oil palm growing States in Nigeria and indirectly to other numerous people involved in processing and marketing of palm oil. Omoti (2001) stated that Nigeria has enormous potential to increase her production of palm oil primarily through application of improved processing techniques. Nwawwe and Edokpay (2005) opined that improved technologies that meet both growth and sustainability goals can be effectively used by oil palm processors. However, most technologies are designed for developed rather than developing countries.

The palm oil is a common cooking ingredient in Nigeria and has increasing use in the commercial food industry in Nigeria and other parts of the world. It is locally used in cooking and in the manufacture of candles, margarine and soap (Akangbe *et al*., 2011). It is used extensively in the tin plate industry, protecting cleaned iron surfaces before the tin is applied. It is also used as lubricant in the textile and rubber industries. A recent innovation is the use of palm oil as an environment-friendly carrier in pesticide formulations (Griffee, Diemer and Chinchilla, 2012 as cited in Ada-Okungbowa, Oghorodi and Omofonmwan, 2013).

Palm oil marketing is concerned with all stages of operation that aid movement of the produce from the producer to the final consumer. These include: assemblage, storage, transportation, grading and financing. Marketing of palm oil in Nigeria takes place in homes, road sides, local/periodic market centres and stalls. These can be both wholesale and retail types in both rural and urban markets (Nwauwa, 2011). Generally, palm oil is transported from the supply regions of Southern Nigeria to the demand regions of Northern Nigeria. Price of palm oil is largely affected by production or output of the palm oil within the year and general inflation rate in the country. After processing, 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. 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. Major distribution points for palm oil ranges from market stalls, wholesale points, palm oil depots or beaches and supermarkets. Each of these points is characterized by activities of trading associations or unionism which does not permit free entry into the business of palm oil marketing as the case may be. This compels distributors to register with some heavy amount of money to join the union, buy kola and beer etc, for the union members before being allowed to sell his goods from that location. Thus, the members fix price of palm oil through the union and force members to sell at that price (Nwauwa, 2012).

In marketing literature, there is no single, universally accepted definition of marketing but a whole spectrum, which shows the diversity of perspectives adopted by different writers. Different academic backgrounds or areas of employment of the authors giving the definitions might have accounted for such divergent viewpoints on marketing (Adeleye, 2011). The American Marketing Association (AMA) (2013) defined marketing as the activity, set of institutions and process for creating, communicating, delivering, and exchanging

offerings that have value for customers, clients, partners and society at large. Agwu, Eke, Nwachukwu and Ogbu (2010) described marketing as a machine that directs production along the line most suited to consumer requirement, thus production is limited by the extent of marketing. The function of marketing in an economic system is to ensure that consumers get the product they desire at the right form (form utility) and at the right time (time utility), to fully satisfy the consumer (Okoh, Ugwumba and Elue, 2008); it enables producers such as farmers as well as middlemen to earn income with which they purchase other useful goods and services (Ebe, 2007). In all, marketing involves all activities engaged for the movement of goods that consumers need from points of production to points of purchase by the consumers (Crammer, Jensen and Southgate, 2000; Nnabuife, Ugwumba and Uzuegbunem, 2012).

The marketing of agricultural products begins at the farm when the farmer harvests his products. The product when harvested may not go directly to the consumers. Firstly, it is likely to be located some distance from the place of consumption. Secondly, storage is required to adjust supply to meet demand. Thirdly, a product when it has been harvested is rarely in a form acceptable to consumers. Therefore, it must be sorted, cleared and processed in various ways and must be presented to the consumer in convenient quality and quantities. Finally, the farmer expects payment when his produce leaves his possession, and hence some financial arrangements must be made to cover all the various stages until the retailer sells the products to the final consumer (Asogwa and Okwache, 2012).

Marketing efficiency refers to the effectiveness with which the marketing agents utilize the available resources to achieve maximum revenue (Nnabuife *et al.*, 2012). It can be economic efficiency, otherwise referred to as productive or overall efficiency (which is a combination of technical and allocative efficiencies), when profit maximization is considered (Ugwumba, 2011). It can be technical efficiency which entails the production of maximum output given the level of inputs employed (Ugwumba, 2011), or input allocative efficiency, which is using the available inputs in optimal proportion given their respective prices and available production/marketing technology (Ugwumba, 2010).

In local markets in the study area, market price of palm oil is rising due probably to rising population, increasing demand and decreasing supply, hence widening demand-supply gap. This widening demand-supply gap can also be attributed to the existence of inefficiency in the marketing system due to marketing problems such as lack of market information, poor market structure, high cost of transportation, lack of capital, poor storage facilities, limited markets and large number of intermediaries (Ebe, 2007; Ugwumba and Okoh, 2010).

Adekaren and Orewa (2009) laments that with the scarcity and soaring demand for palm oil and other related palm oil products, improvement in the production, processing and marketing of palm oil cannot be over emphasized. It is important to recall that various presidential initiatives on some crops including oil palm and palm oil products have improved considerably. Nevertheless, there still appears to exist inadequate production and distribution formulae for the product especially in the South-South region of Nigeria. The marketers seems not to be reaping the full economic benefits of the product as majority of them still remain in abject poverty and unable to expand their business frontier.

Undeniably, there is a critical literature gap on palm oil marketing in the South-South States of Nigeria. There is absence of consumer-focused marketing, lack of astute understanding of what consumers want and the inability to deliver palm oil in adequate quantity and quality to the consumers and thus ensuring its availability all year round in the study area. Again, differences in inter-market margin could be due to product scarcity resulting from over dependence on importation. Although many studies have been done in Nigeria on production of staple food crops such as cassava, yam, maize and rice, fewer studies have been carried out on palm oil

production and little or nothing on palm oil marketing, especially in South-South States of Nigeria, hence this study intended to: describe the socio-economic characteristics of palm oil marketers and the influence of these characteristics on the net marketing income realized from the business; ascertain the market structure for palm oil; estimate the profitability of palm oil marketing by the intermediaries; estimate the palm oil marketing efficiency levels attained by the intermediaries; examine the inter market and seasonal price spread among the agents; and identify constraints to palm oil marketing in the area.

Theoretical Framework- The Theory of Consumer Behaviour

Marketing concept emphasizes that profitable marketing begins with the discovery and understanding of consumer needs and then develops a marketing mix to satisfy these needs. Thus, an understanding of consumers and their needs and purchasing behaviour is integral to successful marketing. Unfortunately, there is no single theory of consumer behaviour that can totally explain why consumers behave as they do. Instead, there are numerous theories, models, and concepts making up the field. In addition, majority of these notions have been borrowed from a variety of other disciplines, such as sociology, psychology, anthropology, and economics, and must be integrated to understand consumer behaviour (Peter and Donnelly, 2007).

Belch and Belch (2004) defines consumer behaviour as the process and activities people engage in when searching for, selecting, purchasing, using, evaluating, and disposing of products and services so as to satisfy their needs and desires. They went further to state that three sets of variables influence the consumers' purchase decisions. Firstly, the personal influences comprising the personal characteristics of consumers, notably the consumer's demographic variables (age, occupation and economic circumstances), lifestyle, personality and self-concept. The second set of variables that affect consumers' purchase decisions are referred to as psychological influences or predispositions of individuals to react positively or negatively towards the firm's products or services. The psychological influences consist of consumer's perception, learning, motivation, needs and attitudes. Lastly, the environmental influences on consumer behaviour are culture, sub-culture, social class, reference groups, family and word-of-mouth communication.

The traditional theory of demand starts with the examination of the behaviour of the demands of individual consumers. The consumer is assumed to be rational. Given his income and the market prices of the various commodities, he plans the spending of his income so as to attain the highest possible satisfaction or utility. In order to attain this objective the consumer must be able to compare the utility (satisfaction) of the various baskets of goods which he can buy with his income (Koutsoyiannis, 1977).

Consumer behaviour refers to the selection, purchase and consumption of goods and services for the satisfaction of the consumer. There are different processes involved in the behaviour of the consumer. Initially the consumer tries to find what commodities he would like to consume, then he selects only those commodities that promises greater utility. After selecting the commodities, the consumer makes an estimate of the available money which he can spend. Lastly, the consumer analyses the prevailing prices of commodities and takes the decision about the commodities he should consume. Meanwhile, there are various other factors influencing the purchases of consumers such as social cultural, personal and psychological (Asifo, 2010).

Consumer behaviour is influenced by internal conditions such as demographics, psychographics (lifestyle), personality, motivation, knowledge, attitudes, beliefs, and feelings. Psychological factors include an individual's motivation, perception, attitude and belief, while personal factors include income level, personality, age, occupation and lifestyle. Lastly, the environmental influences on consumer behaviour are culture, sub-culture, locality, royalty, ethnicity, family, social class, past experience, reference groups, lifestyle, and market mix factors (Adeleye, 2011). According to Hoyer

and Maclnnis (2001) consumer behaviour reflects the totality of consumers' decisions with respect to the acquisition, consumption and disposition of goods, services, time and ideas by (human) decision making units (over time).

METHODOLOGY

The study was conducted in the South-South States (Niger delta) of Nigeria which comprises Akwa-Ibom, Bayelsa, Cross Rivers, Delta, Edo and Rivers States. It covers an area of 84,587km^2 and has a coastline spread over 540km with a population of 21,014,655 (National Population Commission (NPC), 2006). The area is bordered to the South by the Atlantic Ocean and to the East by Cameroun (Edoumiekumo, Karimo and Tombofa, 2014). The climate is essentially tropical and humid and so experiences heavy and abundant rainfall. The annual rainfall is usually above 2,000 mm. Over 4,000 mm of rainfall is received in the coastal part around the Niger delta area. Bonny town found in the coastal region of the Niger delta area receives well over 4,000 mm of rainfall annually. It is characterized by two high rainfall peaks, with a short dry season and a longer dry season falling between and after each peak. The first rainy season begins around March and last to the end of July with a peak in June, this rainy season is followed by a short dry break in August known as the 'August break' which is a short dry season lasting for two to three weeks. This break is broken by the short rainy season starting around early September and lasting to mid-October with a peak period at the end of September. The ending of the short rainy season in October is followed by long dry season. This period starts from late October and lasts till early March with peak dry conditions between early December and late February.

Until the environmental degradation and disturbance of the ecosystem through oil exploration and exploitation activities, fishing has been a major economic activity in the area. People in the zone predominantly engage in Agriculture. Yam, cassava, cocoyam, plantains, oil palms and bananas are the main crops grown. The inhabitants also participate in palm oil milling, lumbering, palm wine tapping, local gin making, trading, carving and weaving. The most important mineral in the area is petroleum (Edoumiekumo *et al*., 2014).

The study population was made up of all palm oil marketers in the South-South States (Akwa-Ibom, Bayelsa, Cross River, Delta, Edo and Rivers) of Nigeria. Multistage and random sampling procedures were used to select two states (Rivers and Bayelsa states), 10 Local Government Areas (Yenagoa, Kolokuma/Opokuma, Ogbia, Southern Ijaw and Sagbama in Bayelsa State and Obio/Okpor, Ahoada West, Ahoada East, Ogba/Egbema/Ndoni and Port Harcourt city in Rivers State), 10 daily palm oil markets (Creek road, Mile three, Omoku, Mbiama and Ahoada markets in Rivers State; Swali, Sagbama, Kaiama, Amassoma and Ogbia town markets in Bayelsa State) and 200 intermediaries (twenty palm oil marketers consisting of five wholesalers and fifteen retailers were randomly selected from each of the selected ten markets) for the study.

Data for the study were collected from primary sources. Primary data were obtained using well-structured and pre-tested questionnaire administered to the respondents by personal interview. Two hundred and fourty (240) copies of the structured questionnaire were administered, however 200 best completed copies were sorted and used for data collation. Data were collected on socio-economic characteristics of the respondents such as age, gender, marital status, household size, educational level, marketing experience etc. Additional data were collected on revenue and costs variables as well as constraints to palm oil marketing. Descriptive and inferential statistics such as tables, means, frequency distributions, percentages, Gini coefficient (G.C), budgetary method, Sherpherd-Futrell technique and multiple regression analysis were used for data analysis.

The Gini coefficient used to determine market concentration or nature of competition in the market (i.e. market structure) is given as:

Where:
G= Gini coefficient (number)
X = Marketing agents (number)
Y = Volume of trade (₦)

X = cumulated proportion of marketing agents (population variable)

Y = cumulated proportion of sales (volume of trade)
n = number of observations
K = n-1

The budgetary technique (Ugwumba *et al*., 2012) was used to determine the profitability of palm oil marketing. The technique is expressed as:

Where:
NMI / Profit = Net Marketing Income / Profit
= Sum
$P_{yj}Y_j$= Unit price x quantity of j^{th} respondent's sales = Total revenue (TR) for j^{th}respondent.
$P_{Xij}Y_{ij}$= Prices x quantities of j^{th} respondent's variable inputs = Total variable cost (TVC) for j^{th} respondent.
F_{ij}= Depreciation values of equipment, annual rent for store, interest on loan, e.t.c. for j^{th} respondent = Total fixed cost (TFC) for j^{th} respondent.
TC = Total cost (TVC + TFC).

The marketing efficiency of palm oil was determined using the Sherpherd-Futrell technique, which is considered as an accurate measure of marketing efficiency. Coefficient of marketing efficiency is the total cost of marketing to total revenue expressed in percentage term. It is specified as:

$$ME = \frac{TC}{TR} X$$

Where:
ME = Coefficient of marketing efficiency.
TC = Total marketing cost incurred.
TR = Total value of products sold.

The multiple regression model used to determine the influence of socio-economic factors of the respondents namely age represented by (AGE), gender (GEN), marital status (MAS), household size (HOS), educational status (EDU), marketing experience (EXP), marketing cost (MC), product price (PDP) and type of intermediary (TOI) on net marketing income was given as:
NMI = f (AGE, GEN, MAS, HOS, EDU, EXP, MC, PDP, TOI + e)
Where:
NMI = Net Marketing Income (₦)
AGE = Marketers' age in years
GEN = Marketers' gender (dummy: male = 1; female = 2)
MAS = Marketers' marital status (dummy: married = 1; otherwise = 2)
HOS = Household size (number of persons in the household)
EDU = Marketers' education (years of schooling obtained)
EXP = Marketers' experience in years
MC = Marketing cost (₦)
PDP = Product price (₦)
TOI = Type of intermediary (dummy: wholesaler = 1; retailer = 2)
e = Stochastic error term
Four functional forms of the regression models (linear, exponential, semi-log and double-log) were tried andoutput of the form that best fit the data was adopted as the lead equation.
The explicit versions of the functional model are stated as:

Linear: $NMI = \beta o + \beta_1 AGE + \beta_2 GEN + \beta_3 MAS + \beta_4 HOS + \beta_5 EDU + \beta_6 EXP + \beta_7 MC + \beta_8 PDP + \beta_9 TOI + e_i$

Exponential: $InNMI = \beta_0 + \beta_1 AGE + \beta_2 GEN + \beta_3 MAS + \beta_4 HOS + \beta_5 EDU + \beta_6 EXP + \beta_7 MC + \beta_8 PDP + \beta_9 TOI + e_i$

Semi-log: $NMI = \beta o + \beta_1 InAGE + \beta_2 InGEN + \beta_3 InMAS + \beta_4 InHOS + \beta_5 InEDU + \beta_6 InEXP + \beta_7 InMC + \beta_8 InPDP + \beta_9 InTOI + e_i$

Double-log: $InNMI = \beta o + \beta_1 InAGE + \beta_2 InGEN + \beta_3 InMAS + \beta_4 InHOS + \beta_5 InEDU + \beta_6 InEXP + \beta_7 InMC + \beta_8 InPDP + \beta_9 InTOI + e_i$

RESULTS AND DISCUSSION

Market structure of palm oil

Dillon and Hardaker (1993) as cited in Nkasiobi (2013) stated that a Gini coefficient greater than 0.35 is high and indicates an inequitable distribution. In other words, higher Gini coefficient means higher level of concentration and consequently high inefficiency in the market structure. Result of the analysis of market structure using the Gini coefficient is shown in Table 1. It could be observed from the table that the index for producers was 0.341. This result showed that the concentration ratio for the producers was low. This implied that no single supplier was able to control a large share of palm oil supply in the market. The result also indicated that there were many small scale of palm oil suppliers in the market and none could influence the supplies either by increasing or reducing the quantity being supplied thereby influencing price. Further results of the analysis showed that wholesalers and retailers also recorded low indices of 0.256 and 0.214 respectively, implying that there were many wholesalers and retailers in the market such that none of them had control over the largest portion of total sales' volume at respective levels hence a fairly competitive market structure. Ekine *et al.* (2006) reported Gini coefficient indices of 0.525, 0.561 and 0.399 for producers, wholesalers and retailers respectively in Ikwerre LGA and 0.492, 0.557 and 0.368 for ₦10,325,500. Separately, the wholesalers and retailers realized net marketing incomes, mean net marketing incomes, return on investment and net return on investment figures of ₦6,216,100 and₦4,109,400; ₦124,322 and₦27,396; 1.98 and 1.42; and 0.98 and 0.41 respectively. The net return on investment figures implied that the wholesalers realized 98 kobo and 41 kobo respectively on every 100 kobo expended on the enterprise in a month. The result implied that the enterprise was profitable in line with Adakaren *et al*. (2012), Ada-Okungbowa *et al.* (2013), and Ibitoye (2014) who in their separate studies reported that palm oil marketing was profitable.

Marketing efficiency of palm oil

A marketing system is efficient if the calculated marketing efficiency value is equal to one or 100%. Sherpherd-Futrell method was used to compute the co-efficient of marketing efficiency, expressed as the ratio of total cost to total revenue expressed as percentage.

producers, wholesalers and retailers respectively in Etche LGA all in Rivers State to establish the existence of an oligopolistic market structure for palm oil in the State.

Profitability of palm oil marketing

The estimated monthly profitability of palm oil marketing is shown in Table 2. Out of the total cost of marketing palm oil, purchases constituted 97.7% to become the most important cost item in the business, followed by fixed cost 1.04%, transportation 0.86%, loading 0.25%, off-loading 0.14% and miscellaneous costs 0.06%. A total revenue of ₦26,623,500 was realized by the intermediaries (wholesaler and retailers together) after spending ₦16,292,500 to make a profit of

The higher the percentage, the lower the

efficiency since more of the revenue is expended on cost. Therefore, the wholesalers (50.5%), were more efficient than the retailers (70.7%) in the business having spent less of their sales revenue on cost. This result contradicts Ugwumba *et al.* (2012) and Ugwumba, Obiekwe and Ozor (2016) who noted that the retailers of water melon and African giant snail respectively were more efficient than the wholesalers in the business.

Inter market and seasonal price spread

The peak production season for palm oil is from January to May, while the lean production season is from June to September. During the peak season, the price of palm oil generally drops

only to rise again at the expiration of the peak production season. Tables 3 and 4 showed the peak season wholesale and retail marketing margins of palm oil across the selected States and daily markets. Per 20 litre jerry-can mean marketing margin realized by the wholesalers was highest in Sagbama and Kaiama markets (₦2,000 each), followed by Ogbia (₦1,600), Amassoma, Ahoada and Omoku (₦1,500 each), Swali (₦1,400), Mbiama (₦1,300), Mile 3 (₦1,200) and Creek road (₦1,200) markets. The observed differences in marketing margins was as a result of the selling price differentials arising from differences in marketing costs incurred by the traders at the different markets. The highest retail mean marketing margin of ₦2,500 was recorded in Sagbama and Amassoma markets, followed by ₦2,000 in Swali, Kaiama, Omoku, Mbiama, Mile 3, Creek road and Ahoada markets while the lowest retail mean marketing margin of ₦1,800 was recorded in Ogbia market. The average marketing margin per 20 litre jerry-can of palm oil sold by wholesalers in Bayelsa State was ₦1,700 and ₦2,160 for retailers, whereas in Rivers State it is ₦1,340 and ₦2,000 for wholesalers and retailers respectively. This meant the average marketing margin for both the wholesalers and the retailers were higher in Bayelsa State. This could be attributed to the fact that much of the supply of palm oil in Bayelsa State came from outside the State, thus increasing the marketing cost.

Lean season marketing margin realized by the wholesalers and retailers operating in markets across the two States are shown in Tables 5 and 6. Inter market mean marketing margin for wholesalers was highest in Sagbama, Kaiama and Amassoma markets (₦3,000 each), while Creek road and Mile 3 recorded the lowest of ₦2,500. Highest retail mean marketing margin of ₦2,500 was realized in Sagbama, Kaiama, Amassoma, Ogbia and Swali markets, while Ahoada market recorded the least of ₦1,800.

The study noted that prices within the markets were uniform. This implied the prevalence of free flow of price information and other characteristics of fairly competitive market across palm oil markets in the study area. The slight differences in the marketing margins among the markets might be as a result of differences in location of the markets, hence transportation costs incurred by the marketers.

Influence of respondents' socio-economic factors on net marketing income

The multiple regression analysis was used to determine the effects of respondents' socio-economic factors such as age represented by AGE, gender (GEN), marital status (MAS), household size (HOS), educational level (EDU), marketing experience (EXP), marketing cost (MKC), product price (PDP) and type of intermediary(TOI) on net marketing income. Four functional forms of the regression model (linear, exponential, semi-log and double log) were fitted with the data and ran using the MINITAB statistical software. The result is shown in Table 7. Output of the linear regression form gave the best results in terms of econometric *apriori* criteria and was therefore chosen as the lead equation. The equation is given as:

NMI = 136.437 – 381.0AGE – 1739GEN – 4421MAS + 588.6HOS – 605.7EXP – 475.6EDU – 57003TOI – 1.243PDP + 0.70920MKC

Out of the nine regressors introduced into the model, six (age, marital status, marketing experience, educational status, type of intermediary and marketing cost) exerted significant influences on net marketing income while the rest three (gender, product price and household size) were not significant. The R^2 value of 94.9% implied that 94.9% of the variation in net marketing income realized by the marketers was due to variations in the exogenous variables while the rest 5.1% was as a result of stochastic noise. The F-statistic value of 392.25 was statistically significant at 5% level of probability. This indicated that the socio-economic variables together significantly influenced net marketing income and that the regression model was a good fit.

The coefficient of age was significant at 5% level but negatively related to net marketing income. This is at variance with *a priori*

expectations and implied that the older marketers tend to lose out of the business as a result of age and the tedious nature of the business especially at the wholesale level. This is in agreement with Nenna and Ugwumba (2012) who reported a negatively relationship between age and income.

The coefficient of marketing experience was significant at 5% level but negatively related to net marketing income. This is at variance with *a priori* expectations. It implies that a marketer who has spent more years in business and may have acquired more capital and skills over the years is more likely to realize more profit. This result is at variance with Agwu and Ibeabuchi (2011) and Obasi *et al.* (2014) which reported that the marketers with more years of marketing experience realized more net marketing income.

The coefficient of marital status was significant but had negative relationship with net marketing income. This implied that married individuals are more likely to spend more as a result of family demands and thus affect the growth of the business. This finding is at variance with Ugwumba *et al.* (2016) that marital status had positive but not significant effect on net marketing income.

The coefficient of educational attainment of the respondents was significant at 5 % level but had a negative relationship with net marketing income. This is against *a priori* expectation and implied that higher the educational attainment of the marketers, lower the marketing income. Those with higher educational qualification tend to lose out of the business as a result of lack of interest due to their passive understanding that the business is below the level of education they have attained. This is at variance with Obasi *et al*. (2014) that educational attainment was positively related to income.

The coefficient of type of intermediary was negative but had statistically significant influence on marketing income at 1% probability level. This implied that there was significant difference in the net marketing income of wholesalers and retailers in favour of the wholesalers.

The coefficient of marketing cost had positive relationship with net marketing income and was statistically significant at 1% probability level. This is against *a priori* expectation. This implied that the marketers who had their marketing costs increased by increasing their investments in the business earned higher profit as a result of the action. This result contradicts Ojo *et al.* (2014) and Obasi *et al.* (2014) that marketing cost had negative and statistically significant influence on net returns from palm oil marketing in Oyo State.

Constraints to palm oil marketing

The constraints to palm oil marketing in the area are shown in Table 8. For the wholesalers, the problem of high cost of transportation ranked highest and was perceived as the most serious (M=3.28). This is in line with the findings of Obasi *et al*. (2014) and Obasi and Kalu (2015) that transportation cost was the most critical factor affecting marketers and their performance in many developing economies. This was basically attributable to bad road network which characterizes the area. This constraint was closely followed by inadequate capital (M=3.22), poor and unstable price (M=3.14), high market fee (M=2.90), poor storage facilities (M=2.46) and poor sales (M=2.36).

Further result of the analysis indicated that palm oil marketing at the retail level was seriously constrained by inadequate capital (M=3.53). This is in consonance with the report of Ada-Okungbowa *et al*. (2013) and Udoh and Essien (2015) that majority of respondents had problem of inadequate money for their marketing business. Other constraints included poor and unstable price (M=3.53), poor sales (M=3.44), high market fee (M=3.18), poor storage facilities (M=2.97) and high cost of transportation (M=2.83).

CONCLUSION AND RECOMMENDATIONS

Palm oil marketing in the study area was profitable at both the wholesale and retail levels given the positive values of marketing margin, net marketing income, return on investment and gross ratio. Profitability would improve if measures are

taken to ameliorate the marketing problems identified by the study to be responsible for high marketing costs and the existence of inefficiencies.

Since most of the markets are located in the rural areas, Local Government Authorities and other development agencies such as LEEMP (Local Empowerment and Environmental Management Project) and CSDP (Community Social Development Project) should promote rural development involving agricultural marketing activities through the provision of good road network, marketing infrastructures, building of new model markets; rebuilding and expansion of old markets.

Communities were markets are located should provide marketing infrastructures such as Boreholes, land for expansion and good access road network so as to reduce the cost of marketing and consequently improve efficiency.

Government should strengthened financial institutions such as the Bank of Agriculture to provide soft loans to palm oil marketers at very low interest rate.

The palm oil marketers should form themselves into cooperatives to enable them make bulk purchases of the product at cheaper rates, source cheap credit facilities from government financial institutions, consequently empower more of their members and become economically stable.

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Table 1: Estimated Gini coefficient of the marketing agents

Agent	Gini coefficient	STD	Minimum	Maximum
Producer/supplier	0.341	0.039	0.267	0.375
Wholesaler	0.256	0.025	0.196	0.301
Retailer	0.214	0.008	0.181	0.246

Source: Computed from survey data, 2016.

Table 2: Estimated monthly profitability of palm oil marketing

Variable	Wholesaler	Retailer	WH & RT	% of TC
Total revenue	12,558,500	14,065,000	26,623,500	
Variable cost (VC)				
Purchases	6,117,500	9,803,200	15,920,700	97.7
Transportation	80,000	60,000	140,000	0.86
Loading	30,000	10,000	40,000	0.25
Off-loading	14,200	8,200	22,400	0.14
Miscellaneous cost	2,300	7,500	9,800	0.06
Total Variable Cost (TVC)	6,239,000	9,888,900	16,127,900	99
Gross Margin (TR – TVC)	6,319,500	4,176,100	10,495,600	
Fixed Costs (FC)				
Annual shop rent	41,500	26,500	68,000	0.42
Depreciation on equipment	36,900	40,200	77,100	0.47
Total Fixed Cost (TFC)	103,400	66,700	170,100	1.04
Total Cost (TC=TVC+TFC)	6,342,400	9,950,100	16,292,500	100
Net Marketing Income	6,216,100	4,109,400	10,325,500	
Return on investment (TR/TC)	1.98	1.42		
Net return on investment	0.98	0.41		
Gross ratio (TC/TR)	**0.51**	**0.71**		

Source: Field survey, 2016. Note: WH- Wholesaler. RT- Retailer. TC- Total cost.

Table 3: Peak season wholesale marketing margins of palm oil (₦/20 litre can)

State	L.G.A	Market	Mean purchase price	Mean selling price	Mean marketing Margin
Bayelsa	Ogbia	Ogbia	1,600	3,200	1,600
	Yenagoa	Swali	1,600	3,000	1,400
	Sagbama	Sagbama	2,000	4,000	2,000
	Kolokuma/Opokuma	Kaiama	2,000	4,000	2,000
	Southern Ijaw	Amassoma	2,000	3,500	1,500
Rivers	Port Harcourt City	Creekroad	1,800	3,000	1,200
	Obio/Akpor	Mile 3	1,800	3,000	1,200
	Ahoada East	Ahoada	1,500	3,000	1,500
	Ogba/Egbema/Ndoni	Omoku	1,500	3,000	1,500
	Ahoada West	Mbiama	1,500	2,800	1,300

Source: Field survey, 2016.

Table 4: Peak season retail marketing margins of palm oil (₦/20 litre can)

State	L.G.A	Market	Mean purchase price	Mean selling price	Mean marketing Margin
Bayelsa	Ogbia	Ogbia	3,200	5,200	1,800
	Yenagoa	Swali	3,000	5,000	2,000
	Sagbama	Sagbama	4,000	6,500	2,500
	Kolokuma/Opokuma	Kaiama	4,000	6,000	2,000
	Southern Ijaw	Amassoma	3,500	6,000	2,500
Rivers	Port Harcourt City	Creekroad	3,000	5,000	2,000
	Obio/Akpor	Mile 3	3,000	5,000	2,000
	Ahoada East	Ahoada	3,000	5,000	2,000
	Ogba/Egbema/Ndoni	Omoku	3,000	5,000	2,000
	Ahoada West	Mbiama	2,800	4,800	2,000

Source: Field survey, 2016.

Table 5: Lean season wholesale marketing margins of palm oil (₦/20 litre can)

State	L.G.A	Market	Mean Purchase Price	Mean Selling price	Mean Marketing Margin
Bayelsa	Ogbia	Ogbia	2,500	5,000	2,500
	Yenagoa	Swali	2,500	5,000	2,500
	Sagbama	Sagbama	2,500	5,500	3,000
	Kolokuma/Opokuma	Kaiama	2,500	5,500	3,000
	Southern Ijaw	Amassoma	2,500	5,500	3,000
Rivers	Port Harcourt City	Creekroad	2,500	5,000	2,500
	Obio/Akpor	Mile 3	2,500	5,000	2,500
	Ahoada East	Ahoada	2,500	5,200	2,700
	Ogba/Egbema/Ndoni	Omoku	2,500	5,000	2,500
	Ahoada West	Mbiama	2,500	5,000	2,500

Source: Field survey, 2016.

Table 6: Lean season retail marketing margins of palm oil (₦/20 litre can)

State	L.G.A	Market	Mean Purchase Price	Mean Selling price	Mean Marketing Margin
Bayelsa	Ogbia	Ogbia	5,000	7,500	2,500
	Yenagoa	Swali	5,000	7,500	2,500
	Sagbama	Sagbama	5,500	8,000	2,500
	Kolokuma/Opokuma	Kaiama	5,500	8,000	2,500
	Southern Ijaw	Amassoma	5,500	8,000	2,500
Rivers	Port Harcourt	Creekroad	5,000	7,000	2,000
	Obio/Akpor	Mile 3	5,000	7,000	2,000
	Ahoada East	Ahoada	5,200	7,000	1,800
	Ogba/Egbema/Ndoni	Omoku	5,000	7,000	2,000
	Ahoada West	Mbiama	5,000	7,000	2,000

Source: Field survey, 2016.

Table 7: Determinants of net marketing income realized by the marketers

Predictor	Linear	Exponential	Semi-log	Double-log
Constant	136.4374.39235	-26177	-4.6077	
	(10.32)	(49.91)	(-0.12)	(-7.43)
AGE	-381.0	0.00435	-50424	0.01008
	(-1.91)**	(3.27)**	(-1.47)	(0.10)
GEN	-1739	-0.01583	2022	-0.02203
	(-0.79)	(-1.08)	0.18	(-0.66)
MAS	-4421	0.00031	-22845	-0.03607
	(-2.04)**	(0.02)	(-2.04)**	(-1.11)
HOS	588.6	-0.000163	16405	0.03855
	(1.04)	(-0.04)	(1.08)	(1.46)
EXP	-605.7	-0.0029	-9948	-0.02446
	(-2.46)**	(-1.77)**	(-1.30)	(-1.10)
EDU	-475.6	0.0036	NA	NA
	(-2.23)**	0.96)	(NA)	(NA)
TOI	-57003	-0.67041	-171217	-2.04935
	(-10.22)***	(-18.07)***	(-5.41)**	(-21.28)***
PDP	-1.243	0.000123	-99741	1.3259
	(-0.57)	(8.50)**	(15.00)**	(7.97)**
MKC	0.709200.0000042		120530	0.93662
	(28.35)***	(25.25)***	(15.00)***	(40.07)***
R^2	94.9%	95.1%	87.5%	97.7%
R^2 (adjusted)	94.7%	94.8%	87.0%	97.6%
F-statistic	392.25	406.62	167.66	1012.58
Durbin-Watson Stat.	1.85	1.58	2.01	1.72

Source: Field survey, 2016. Note: NA = Not available. ** = Significant at 5% alpha level.
*** = Significant at 1% alpha level. Figures in ( ) are T- ratios.

Table 8: Constraints to palm oil marketing

	Wholesalers		Retailers	
Parameter	**Mean score**	**Rank**	**Mean Score**	**Rank**
High cost of transportation	3.28	1st	2.83	6th Poor and
unstable price	3.14	3rd	3.53	2nd Inadequate
storage facilities	2.46	5th	2.97	5th Poor sales
High market fees	2.36	6th	3.44	3rd
Inadequate capital	2.90	4th	3.18	4th
	3.22	2nd	3.53	1st

Source: Field survey, 2016.