Problems and Prospects of Small- Scale Palm oil Processing in Delta- State, Nigeria

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Abstract
Palm oil processing is an agricultural venture that is both challenging and rewarding. This work determined the profitability of palm oil processing and examined, the problems associated with palm oil processing in the study area. This findings will both serve as an attraction to potential palm oil processors and also as a warning to all those who may want to adopt the recommended palm oil processing technologies in the study area. The study made use of multistage sampling technique to select 164 respondents among palm oil processors in the study area. Data analysis was carried out using descriptive statistics. The result of the analysis shows that the average profit of palm oil processors was N839,260 per annum, while maximum processors can earn up to N8,050,000 per annum which is an indication that palm oil processing can be very profitable when managed adequately. However, that is not to say palm oil processing is without challenges or constraints. This study also highlight the constraints facing processors, these includes; high cost of palm oil processing, lack access to credit facilities and lack of government support among others.
Keywords: Adoption, constraints, income, processors, profit

INTRODUCTION

Palm oil is endowed with good technical attributes and economic advantage as one of the most produced and consumed oil. Palm oil is also said to beckon on its users by its price and technical superiority among multitude of edible oil applications due to its availability all year round (Ugwu, 2009). For the palm oil processing industry to sustain this competitive edge, continued research is very crucial in regard to appropriate processing technology to pave the way forward in shaping the future of the palm oil industry. However, in Nigeria, 80% of palm oil processors comes from dispersed smallholders who harvest semi-wild palm fruits and use manual processing techniques, a processing technique that is labour intensive and highly inefficient, with a low palm oil extraction rate and high free fatty acid (ffa) content that can be up to 30% in some instances (Orewa *et al.*, 2009; Ugwu, 2009).

Aghalino (2000), emphasized that the motivation for individual participation in the processing of palm oil in pre – colonial period stemmed from the individual's view of what he or she stands to gain from the exercise. Due to its economic value, palm oil processing is considered as a traditional source of revenue for people. Men for instance processed palm oil to meet domestic consumption needs and to satisfy social obligation such as payment of bride's price, buying of essential items such as salt or luxury item like gin. Furthermore, palm oil processing made immense contribution towards meeting the socio-economic needs of processors in the study area. Therefore, palm oil processing serves as a source of livelihood, income and also provides food for processors (Oladipo, 2008).

In Nigeria, improved agricultural technology has contributed significantly to agricultural development and the gap between developed and developing countries in the area of agricultural production can be attributed largely to differences in the level of technological development, adaptation and transfer process. In developed nations, there is an advanced level of technical know-how and widespread application of technological innovations resulting in high productive capability in agriculture as well as in other industries. This is not so in Nigeria where these technologies are not often available to farmers. Where they are made available, few farmers usually have access to them (Adekanye, 1983). During the reconnaissance survey it was observed that many users of the recommended technologies do not own them. Rather, they pay to use the improved processing machines in processing their palm oil at oil mills. This show that there is a reason or reasons why they do not own these machines. Additionally, in adopting new technologies, adopters are expected to experience some hitches or problems in relation to the adopted technologies. Adopters of recommended palm oil processing technologies are also likely to experience some of the challenges that comes with their adoption of the technologies. Hence, an investigation was carried out to reveal the constraints associated with palm oil processing activities in order to identify areas where processors require assistance and empowerment to enable them adopt the recommended processing technologies and if possible, own them. Hence, the objectives of the study were; to determine the profitability of palm oil processing and to identify the major constraints to adoption of recommended palm oil processing technologies.

METHODOLOGY

The study was carried out in Ughelli North and Isoko-North Local government Areas of Delta State. The study focused on the population of people involved in palm oil processing in the study area and multi-stage sampling procedure was used in selecting a total of 164 respondents from Ughelli North and Isoko-North Local government Areas of Delta State. Data were collected through the use of structured questionnaire, observation, and interview. The collected data were analyzed using descriptive and inferential statistics. To analyze the prospect of adopters of recommended palm oil processing technologies, both Z-test and descriptive statistics were used.

$$Z\ score\ =\ \frac{X-\bar{X}}{\sigma}$$

Where: $\bar{X}$ are the means of the samples X is Standardized random variable, σ = Population standard deviation.

RESULTS AND DISCUSSION

Results in Table 1 revealed the quantity of palm oil processed by respondents per annum and the result shows that 63% of the respondents process between 10,020 litres to 30,000 litres per annum. This is an indication that majority of the processors though not being large scale processors, are contributing meaningfully to the palm oil processing enterprise. Meanwhile, 7% of the processors process between 30,020 litres to 40,000 litres of palm oil per annum. This is an indication that adopters of recommended technologies of palm oil processing in the study areas are not doing bad as small scale processors. Agreeably, those who were using traditional method of palm oil processing prior to their adoption of the recommended technologies affirmed that their output has increased considerably since they adopted the recommended technologies. They further added that with traditional method of processing, it will not be possible for just an individual processor to process the same quantity of palm oil as with the recommended technologies (for example 10,000 litres per annum).

Results in Table 1 further made it clear that palm oil processors in the study area are not faring badly profit wise. The results show average revenue (net profit) of processors per annum to be eight hundred and thirty-nine thousand, two hundred and sixty naira (₦839,260), this profit is not too low as an annually generated income for processor, because this will mean an average of sixty-nine thousand, nine hundred and thirty-eight naira (₦69,938.00) per month. Comparing this with federal minimum wage of eighteen thousand five hundred (₦ 18,500), one can conclude that palm oil processing is profitable and also increases the income of the processors.

Additionally, the result further showed that processors can produce maximum of 70, 000 litre of palm oil per annum and make profit that can amount to eight million, fifty thousand naira (₦8,050,000) per year, further analysis revealed that these category of processors can earn up to six hundred and seventy thousand, eight hundred and thirty- three naira (₦670,833.00) in a month. This is an indication that these group of processors are doing very well in terms of income earning. Interestingly, the result also revealed the advantage of bulk processing. The results clearly shows minimum processors paying ₦122.00 to process a litre of palm oil and gain ₦53.00 per litre while the maximum processors spend just ₦60.00 to process a litre and gain ₦115.00 as profit per litre; little wonder, the maximum processors generate above eight million naira a year. Therefore, palm oil processing is more profitable for large scale processors than for small scale processors.

Table 1: Quantity of palm oil produced per Annum by Respondents

Class in Litres per annum	Frequency	Percentages
1-10000	49	29.9
10020-20000	70	42.7
20020-30000	33	20.1
30020-40000	11	6.7
40020-50000	1	0.6
Total	**164**	**100**

Profitability of Palm oil Processing by Respondents

Variables	Cost/Lit	Qty Sold Per Annum (Lit)	Average Price/Lit	Net Profit/Lit	Net Profit/ Annum (₦)
Average	114	14470	175	58	839260
Maximum	60	70000	175	115	8050000
Minimum	122	1080	175	53	57240

Computed from field survey, 2013

Income distribution of respondents per annum is clearly highlighted in Table 2. The result revealed that only twenty nine percent (29%) of the respondents earn five hundred thousand naira or less per annum, while all other respondents earn more per annum. The result also indicates that thirty-two percent (32%) of the respondents earn

more than a million naira per annum, showing that palm oil processing is not a bad business venture. The essence of this result is that all palm oil processors in the study area earn far more than what the United Nations Organization stipulated as the minimum income of $1.25 per day which amounts to ₦70,718.75 per annum (at ₦155 per a dollar) (Wikipedia, 2013). Going by this standard therefore, the result in Table 2 shows that palm oil processors in the area are living above the poverty line.

Further analysis of income distribution per member of household revealed that some palm oil processors in the study area are not living above the poverty line. Going by the United Nations standard, the poverty line set for this study is ₦193.75. However, it is obvious that twenty eight percent (28%) of the sampled households' members lives between one naira and one hundred and fifty naira per day which is far below the poverty line. While only thirty six percent (36%) lives above the poverty line. This indicates that going by income distribution per individual member of household of palm oil processors, palm oil processors in the study area may not be living in abject poverty, or living far below the poverty line of $1.25 per day however, a large number of them (64%) can be said to be relatively poor, either living below the poverty line, on the poverty line or above the poverty line. Therefore, since poverty line is placed at ₦193.75 per day, then quite a number of small scale palm oil processors in the study area are not living above the poverty line.

Table 2: Income Distribution of Respondents in Naira per Annum

Income class	frequency	Percentage	Processors' categories
0-500,000	48	29.27	Small scale
500,001 - 1,000,000	64	39.02	Small scale
1,000,001 - 1,500,000	34	20.73	Large scale
1,500,001 - 2,000,000	11	6.71	Large scale
2,000,001 - 2,500,000	5	3.05	Large scale
2,500,001 - 3,000,000	1	0.61	Large scale
3,000,001 - 3,500,000	1	0.61	Large scale

Income Distribution Per Member of Household in Naira Per Day

Class	Frequency	Percentages	Processors' Categories
1-150	46	28.05	Small scale
151-300	59	35.98	Small scale
301-450	37	22.56	Small scale
451-600	9	5.49	Large scale
601-750	7	4.27	Large scale
751 and above	6	3.66	Large scale
Total	**164**		

Computed from field survey, 2013

In order to compare the mean output and income of the respondents before and after their adoption of the recommended technologies, Z-test was calculated. The result from the Z-test show that the calculated Z of both mean output (2.35) and mean income (3.48) of the palm oil processors were greater than the critical Z-value of 1.96 at 5% level of probability. This result revealed that adoption of recommended technologies has significant effect on output and income of processors. The reason may likely be that adoption of the recommended palm oil processing technologies had boosted their output since it is not as labor intensive as the traditional method therefore, members will be able to increase their output and income after adopting the technology.

Table 3: Result of Z-test of output and income before and after adoption of recommended palm oil processing technologies

Mean		SD	Z- Cal	Z- Critical	Level of probability
Output after	753.1ltr/day	422.6	2.35		
Output before	697.14ltr/day	418.0		1.96	5%
Income before	₦398.08/day	224.25		1.96	5%
Income after	₦1095.57/day	1416.90	3.48		

In every adoption case, adopters are expected to experience some hitches or problems in relation to the adopted technologies. Adopters of recommended palm oil processing technologies are also likely to experience some of the challenges as well. Therefore, analysis of constraints of palm oil processing in the study area revealed that; 83% of the respondents asserted that cost of processing palm oil is high, because of the factors involved. This factors include; cost of cutting the palm fruit bunch from the palm tree; cost of transporting the bunches to where a vehicle can convey them to the mill; cost of transportation to the mill which depend on the distance, cost of splitting the bunches; finally the cost of processing which depends on quantity of palm fruit to

be processed. Adding the cost of buying the palm fruit or of renting the farms, end up squeezing processors' profit margin to the barest minimum especially for those who processes very little quantity of palm oil.

Inaccessibility to palm oil processing facilities was also mentioned as one of the constraints facing the palm oil processors; though only 3% of the respondents considered this to be a problem. Lack of access to credit has brought untold hardship to the processors (52%), in that even when they have an opportunity to buy or rent farms at a relatively low rate, they will not be able to access fund to buy or pay for it. This problem of lack of credit facility was linked to their inability to have a functional association. Respondents confirmed that each time they try to get credit individually, the banks usually ask of the trade union they belong to, or collateral to cover for the credit facilities, either of which they do not possess. Processors also complained about fluctuation of prices. These set of processors asserted that it was the buyers of the palm oil that fix the price because they have a functional association hence, processors are unable to control the price for the buyers. Lack of government support was also mentioned by 35% of the respondents, this constraint was linked to the inability of the processors to have a functional association. This assertion was confirmed by a key informant in charge of extension services in the study area.

High cost of transportation and lack of support from family members were among the constraints mentioned. Bad feeder road was mentioned by 15% of the respondents as one of the constraints facing processors. These respondents asserted that most of the farms where the palm fruit are gotten are not accessible for vehicles. Beside, most drivers often object to carrying palm fruit bunches because they complained that the oil from the fruit get their vehicle stained and dirty. Respondents further asserted that bad road leads to high transportation fare, and this increase processors' hardship and cut down on their profit margin. However, if the feeder roads are accessible to motorist, then processors will likely pay less and earn more profit in their processing enterprise. Other respondents (4%) mentioned that their adult family members do not support them with their labor, since, these family members often consider palm oil processing as a dirty job hence, they are not willing to help in the processing enterprise.

In a similar vein, 20% of Processors complained that government people (extension agents) do not visit them. Lack of capital was also identified as one of the constraints facing palm oil processors, because most processors expressed willingness to own their individual processing mills but for lack of capital to establish it. Even those who owned the few mills available, complained about lack of adequate equipment to operate them. Most mill owners express concern about their inability to equip their staff properly, equipment such as; helmets, wheelbarrows and hand gloves ought to be given to workers at mills, but due to inadequate capital, they are unable to provide these. This problem is also linked to lack of access to credit facilities.

Respondents view the recommended technologies as complex. The test on complexity revealed the weighted mean to be 2.31 as against the calculated mean of 2 which was slightly above the mean score, then the technologies can be said to be complex. This can be seen as one of the constraint to adoption of these technologies because a simple technology will likely be adopted faster than a complex one. Respondents also rated the technologies as very expensive, with a mean score of 2.93. This is an indication that it is not very affordable. Affordable technologies serves as an attraction to potential adopters.

Table 4: Constraints to Adoption of Recommended Technologies

Variables	Frequency	Percent	Rank
High cost of palm oil processing	127	77.4	1st
Access to credit facilities	85	51.8	2nd
Lack of government support	57	34.8	3rd
Lack of extension contact	32	19.5	4th
Fluctuation of selling prices	27	16.5	5th
Bad feeder road	25	15.2	6th
Inaccessibility to processing technologies	6	3.7	7th
High cost of transportation	6	3.7	7th

Variable	**Weighted Mean**	**Decision**
Complexity	2.31	Complex
Expensive	2.93	Very expensive
Compatibility	2.01*	Compatible

* mean score = 2.0

CONCLUSION AND RECOMMENDATIONS

Adoption of the recommended technologies by processors in the study area has contributed immensely to processors' economic situation through income and output increase. Interestingly, one can rightly conclude that palm oil processing holds a good prospect for potential processors who may want to delve into the palm oil processing venture since, palm oil processors are not doing too badly economically. Furthermore, the constraints revealed in the work will also serve as a guide to potential processors of what to expect in the palm oil processing enterprise.

In order to ameliorate the constraints of lack of credit facilities, fund should be made available by government agencies and financial institutions to small-scale palm oil processors by granting credit facilities to them, this will enable processors to purchase recommended palm oil milling technologies. Respondents opined that the recommended technologies for palm oil processing are very expensive, the implication of this finding is that the recommended technologies are not affordable. For this reason, Government should assist the processors by subsidizing cost of processing technologies. The recommended technologies are also allegedly considered to be complex to operate by respondents. This may be due to the fact that processors do not get the right training from the right sources, therefore, training workshops should be organized by government agencies, non-governmental organizations, and private individuals on best practices and management of small scale palm oil mill enterprises in the study area. This will serve as encouragement to processors, make palm oil processing industry to be attractive to potential adopters of recommended technologies and also serve as a means of job creation to the teaming population that are jobless.

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