Constraints to palm oil processing among farm families in selected farm settlements of Osun State

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ABSTRACT

The study investigated constraints to palm oil processing among farm families in selected farm settlements of Osun State. Data were obtained from 150 respondents using interview schedule but only 130 were suitable for analysis. The data were analysed using descriptive and inferential statistics. Majority of the respondents were females (75.4%), married (83.1%) and engaged in part time farming activities (70.0%). More than half (58.5%) had between 11 and 20 years of farming experience while 62.0% earned between ₦101, 000 and ₦200, 000 per /season. All the farmers were involved in oil palm cultivation. Most of the farmers (100%) sourced labour and processing materials from open market, Agricultural Development Programme. Majority of the processors (96.2%) adopted manual operated milling machine as method of palm oil processing.The study recommends the need for adequate extension service to farmers and creation of enabling environment for easy access to credit to procure necessary processing equipment.

Keywords: Palm oil processing, Farm settlements, Extension service, farm families.

INTRODUCTION

Palm oil is a resource capable of satisfying human needs; it is a commodity that farm families have or can process to reach their goals or add values to their lives. Palm oil is an extraction from oil palm. Oil palm (*Elaeis guineesis*) is an ancient tropical tree plant from the West African tropical rain forest region. It is still being cultivated here and across the tropics. Oil palm is a versatile tree crop in the tropics with almost all parts of the tree being useful and of economic value (FAO, 2012). The principal product of oil palm is the palm fruit, which is processed to obtain four major commercial products. These include palm oil, palm kernel oil, palm kernel cake, and biofuel. The extraction of palm oil and kernels can be done by employing non-mechanical traditional method and mechanised/automated method.

Processing oil palm fruits for edible oil has been practiced in Africa for thousands of years, and the oil produced, highly coloured and flavoured, is an essential ingredient in much of the traditional West African cuisine. Until 1934, Nigeria had been the world's largest producer. Both small and large scale producers participated in the industry, but as of 2011, Nigeria was the third largest producer, with approximately 2.3 million hectares (5.7×10^6 acres) under cultivation (Ayodele, T. 2011).The traditional processing is simple, but tedious and inefficient (FAO, 2012). Palm oil is rich in carotenoids, (pigments found in plants and animals) from which it derives its deep red colour, and the major component of its glycerides is the saturated fatty acid palmitic acid; hence it is a viscous semi-solid, even at tropical ambience, and a solid fat in temperate climates (FAO, 2012). Palm oil can be graded into three major categories based on the quantity of free fatty acids (FFA) present in the oil, the three major grades are soft oil which has low free fatty acid, hard oil which has high free fatty acid and special oil which has very low free fatty acid (Iwena, 2012). Worldwide palm oil is used for soap making, metal plating, tin-plating, in cuisine and biofuel. Although palm oil is applied to wounds for its supposed antimicrobial effects, research does not confirm its effectiveness Ekwenye, and Ijeoma, (2005).

Production of palm oil generates employment opportunities, social services and alleviate poverty, Norwana, and Kunjappan (2011); (Ismail, 2012). The organic waste matter that is produced when processing oil palm, including oil palm shells and oil palm fruit bunches can also be used to produce energy. This waste material can be converted into pellets that can be used as a biofuel (Choong, 2012).

For many decades prior to post-colonial era, civil war and discovery of oil, Nigeria was a leading producer and exporter of oil palm. Soyebo, Farinde, and Dionco-Adetayo, (2005). However there has been a noticeable decline in Nigeria's oil palm production. Meanwhile, Nigeria is trying and executing ways to reclaim his leading possession as the world's largest producer of oil palm that it has lost to Malaysia and Indonesia. Effort has been made by government to establish farm settlements with mandate of producing palm oil on a large scale. Though over the years, an appreciable impact of these efforts is being noticed from government, for example, creation of nine (9) farm settlements in Osun State. Farm settlements are agricultural research and extension service centres that were set up in most part of the country in the 1960s to boost food production on large scale, enhance food security and improve livelihood of rural farmers.There are however constraints to palm oil (a product of oil palm) production that need to be reduced to minimal or eliminated for production, sustainability of palm oil on a large scale and for achieving the aims and objectives of establishing farm settlements in the study area.

Hence, this study aimed at ascertain the constraints to palm oil processing in the selected farm settlements of Osun State, Nigeria. The specific objectives were to:

i.   Investigate the sources of inputs by processors,

ii. Identify the various methods of palm oil processing used by respondents, quantity of palm oil produced, and times of extension visitation and

iii. Ascertain the relationship between constraints experienced by palm oil processors and selected socio economic characteristics of the processors in the study area.

It was also hypothesized that there is no significant relationship between the socioeconomic characteristics of palm oil processors and the constraints to palm oil processing.

METHODOLOGY

Study area

The study was carried out in selected farm settlements of Osun State. Osun State has nine farm settlements which are: Ago-Owu, Mokore, Esa-Oke, Iwo, Oyere, Ila-Orangun, Igbaye, Orolu and Olupona. Climatically, Osun State lies within the tropics and has two distinct seasons, the dry and rainy seasons:

The rainy season begins in mid-march to October, and dry season is within November to mid-march. The rainfall pattern is bi-modal, with peaks in June/July and September. Atmospheric temperature varies from 22^0C to around 35^0C; the hottest period of the year commonly is February, while the coldest is usually June/July along with the short period of harmattan, commonly in December. The prevailing wind direction is south-westerly; relative humidity is commonly high throughout the year with an average of $76^%$ Relative Humidity during the rainy season and slightly lower during the dry season.

Study design

The study design is exploratory and population of the study comprises of all registered and non-registered oil palm processors in all the selected farm settlements. A two-stage sampling method was used to select sample for the study. The first stage comprised of random selection of three (3) farm settlements from the nine farm settlements in the state. The second stage comprised of random selection of 50 producers from each of the selected farm settlements giving a total of 150 producers for the study.

The data instrument used was interview schedule on socioeconomic characteristics of palm oil processors, where processors source for inputs, labour, and information, extension visitation, quantity of palm oil produced and the constraints faced by respondents on palm oil production in the study area.

However, of the 150 copies of interview schedule that were administered, only 130 questionnaires which represent about 86.7% response rate were suitable for analysis. Interview schedule with close ended questions were used to obtain information from respondents. Information were obtained on the socioeconomic characteristics of the respondents, sources of information on farm inputs, methods of processing palm oil, extension agents visitation, quantity of palm oil produced and constraints experienced in palm oil production.

Measurement of variables

Constraints to palm oil production is the dependent variable and were measured by requesting processors to respond to a list of constraints according to their level of severity on a 4-point scale. Scores of 4 (very severe), 3 (severe), 2 (less severe), and 1(not severe) were allotted.

Quantity of palm oil produced is independent variable and this was measured by requesting farmers

to indicate the quantity of palm oil produced which were later converted to litres (20litres represent 1keg). The other selected independent variables are age, sex, years of schooling, number of children, farming experience (years), size of farmland (acres) mainly for oil palm plantation, sources of processing inputs, number of times extension agent(s) visited the study area (weekly, fortnightly, monthly or yearly) and Income/season.

Data collected were analysed with the use of simple descriptive statistics such as frequency counts, means, standard deviation and percentages. Pearson moment correlation was used to determine the significance of the relationship between the dependent and the selected independent variables.

RESULTS AND DISCUSSION

Socioeconomic characteristics of the respondents

Table 1 shows that most farmers (98.4 %) were between 31 and 60 years of age while 0.8% of the respondents was above 61 years old, this is in agreement with findings of Soyebo, Farinde, and Dionco-Adetayo, (2005), that observed that majority of farmers are in their active age (31-60). This implies that farmers between the ages of 31 and 60 years were more engaged in farming, than farmers of the rest age groups. Seventy-five percent of the respondents were women while men constituted approximately 25 % of the sample. This disagrees with other findings that established that men are the major stakeholder in palm oil production Onoh, Peter Onoh C.A. (2012). This shows that more women were involved in palm oil production than men (especially in the area of processing). Table 1 further shows that 58.5 % had between 11 and 20 years of farming experience while 21.3% had between 21 and 30 years of farming experience. Only 1.6 % had between 31 and 40 years of farming experience, although farming experience goes along with age, but agriculture especially in the area of palm oil production needs youth's involvement because it is energy driven sector. Results also show that 60.2% of the farmers earned income of between ₦101, 000 and ₦200, 000 per season from palm oil production, 33.4% of the farmers had income of up to ₦100, 000 per season, while 1.6% earned between ₦300, 000 and N400, 000 from palm oil production per season. These trends show that income has a great positive influence on palm oil production, probably because of the yield and net margin, which improve the livelihood of farmers, increase productivity, regenerate national economy, sustain it and also prompt other stakeholders to invest in palm oil production.

Table 1: Distribution of respondents according to demographic characteristics

Age (Years)	Percentages
Up to 30	0.8
31-40	16.9
41-50	60.8
51-60	20.8
>60	0.8
Sex	
Male	24.6
Female	75.4
Farming experience	
≤10	18.6
11-20	58.5
21-30	21.3
31-40	1.6
Years of schooling)	
0-6	57.7
7-12	35.4
13-18	6.9
Income	
≤100,000	33.4
101,000-200,000	60.2
201,000-300,000	4.8
301,000-400,000	1.6
Farm size (Acres)	
≤5	36.1

Age (Years)	Percentages
6-10	10
11-15	19.9
16-20	16.9
≥21	17.1
Extension agent visitation	
Weekly	0
Monthly	0
Fortnightly	27.7
Yearly	72.3

*Source: Field survey, 2014

Majority (36.1%) of the respondents had up to five acres of oil palm plantation while 20% had between 11 and 15 acres of plantation. Only 10% had between 6 and 10 acres of plantation. This further confirmed that size of land is one of the limitations of palm oil production by farmers in the study area and this is in agreement with Onoh and Peter Onoh (2012), that ascertained that it is a common knowledge that oil palm production requires large expanse of land for a profitable production, it also confirms the research done by Enwelu, Nwanegbo, Onoh Peter and Ifejika (2013), which opines that land tenure system and current land policy hinder increase of oil palm/palm oil production and this may have a negative effect on the quantity of palm oil being produced by processors.

Also, about 73% of the respondents indicated that extension agents visited them yearly while 27% indicated fortnightly visitation by extension agents. The implication of this is that, lack of frequent extension contact could have negative effect on the productive capacity of processors. Olagunju,

Oguniyi, Babatunde, Fakayode, and Dekunle (2013), established that extension service has contributory effects on the production capacity of processors. None of the respondents was involved in active cooperative society.

Sources of inputs

Results in Table 2 show that all (100%) respondents sourced hired labour and processing materials (baskets, tarpaulin, broom, drum and firewood) from open market while 80.0% sourced seedlings and digester from Agricultural Development Programme. About 78% sourced labour from family/household members. Also, 57.7% of the respondents sourced seeds from produce merchant who are sale representatives in the settlement. Only 33.1% of the respondents indicated that they obtained labour from other processors and 21.5% got theirs from the open market. This shows that majority of the respondents sourced processing inputs from the open market. They only rely on the ADP for seeds and digester machine.

Table 2: Sources of inputs

Source of inputs*	Type of Input	Percentage
Open market	Hired labour, processing materials	100
ADP	Seedlings, Digester	80.0
Household	Labour	77.7
Produce merchant	Seeds	57.7
Other Processors	Labour	33.1

*Multiple responses
Source: Field survey, 2014

Method of processing oil palm fruits and quantity of palm oil produced

The data in Table 3 show that 96.2 percent of the farmers made use of manual milling machine (digester), while 3.8 percent made use of traditional methods which involved pounding of palm fruits as a way of releasing the palm oil from the fruits and so on. None of the respondents made use of

mechanized/automated machine. This is probably because most farmers in the settlement could not afford it and did not have access to it, as a result of lack of funds and government support. Automated machine however reduces stress and drudgery, eliminates wastages of resources (both material and non-material) associated with palm oil processing. This is because the machine has all the unit of operations for processing palm oil fruits from

sterilization of the palm oil fruits to the purification of the palm oil extracted. The findings is in consonance with previous studies by Unamma, Onwudike, Uwaegbute, Edoga and Nwosu (2004), which show that majority of processors still make use the laborious, time consuming and unhygienic method of palm oil processing and this makes production inefficient and tedious especially for women. More than one third (42.3%) of respondents produced between 20 and 29 litres of palm oil in a season, while 24.6% produced between 30 and 39 litres of palm oil. Only 4.6% of respondents produced more than 49 litres of palm oil. The low quantity of palm oil produced by respondents is a reflection of their low access to quality information, extension agents, improved processing materials and non-access to mechanised processing methods.

Table 3: Distribution of respondents according to processing methods adopted

Processing methods	Percentage
Manual operated	96.2
Traditional method	3.8
Mechanised/Automated	0.0
Quantity of palm oil produced	
0-9	3.1
10-19	21.5
20-29	42.3
30-39	24.6
40-49	3.8
>49	4.6

*Source: Field survey, 2014

Table 4 shows the mean ranking of constraints faced in palm oil production. Low extension visitation (3.51), Inadequate information (2.14), lack of improved processing materials (2.07), marketing (1.93), lack of fund (1.84) were the major production constraints being faced in palm oil production. The constraints have a chain link to each other and the effect of these constraints would be low quantity of palm oil production, consequently the farmers would generate revenue that may be less than the cost of labour. Low extension visitation leads to lack of information which also links to lack of improved processing materials and so on. Extension services have positive effects in reducing poverty status of rural palm oil processors. Its positivity denotes that the higher the number of extension visitations/ contacts with processors, the more productive the processor are and this is not far-fetched from the fact that the more the advice, information, and knowledge received and gained by processors through extension agent the higher the productivity and increase in betterment of processors ways of living. Extension services bridge the gap between output attainable with existing technologies and those actually realized by the farmers at large. The inadequate land can be connected with the land tenure system of tenancy right through leasing and rent which hinder production expansion and that of inheritance which leads to fragmentation of holding. The problem of lack of fund was also as a result of lack of access to credit facilities. Respondents relied mainly on personal savings which was too meagre to effectively finance the business and without credit facilities, the palm oil business may not expand.

Constraints mean ranking

Table 4: Distribution of respondents according to the constraints faced in palm oil production

Constraints	Mean	Standard deviation	Rank
Lack of funds	1.83	1.2	5
Climatic condition	1.33	0.9	7
Inadequate information	2.14	1.2	2
Non-access to modern equipment	1.31	0.8	8
Lack of improved processing materials	2.07	1.1	3
Marketing (middle men)	1.93	1.2	4
Problem of land	1.01	0.1	9
Low extension visitation	3.51	0.6	1
Adulterated seedlings	1.70	1.1	6

*Multiple responses *Field survey, 2014

CONCLUSIONS AND RECOMMENDATIONS

It was established in this study that the majority of the palm oil processors are females and all fall into the active age group, and this implies that women has the great significance in palm oil production, the

major constraints to palm oil production are low extension visitation, inadequate information, lack of mechanised/automated processing equipment, marketing (middle men problems) and lack of funds which have chain link to each other. Based on the findings, the following recommendations were made:

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Government and all stakeholders involved in agriculture should work out the talks on agriculture and provide proper financial motivation of extension workers and the farm settlements, improve efficiency in palm oil processing and capacity to use the most modern processing techniques, all these will combine to boost production, regenerate, enhance and sustain the nation's economy. Respondents in the study area should come together to form cooperatives to enable them access and share useful information. Such associations will also help them pool resources that will enhance acquisition of mechanised processing equipment and farmlands for increase in quantity of palm oil produced and its better efficiency. Financial institutions should make funds available to palm oil processors, this will enable them to procure modern palm oil milling equipment, the cost of the processing equipment should also be subsidized by the government. Training workshops should be organised by relevant stakeholders for processors on best practices and management (storage inclusive) of palm oil to boost the production capacity of processors in the farm settlements.

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