



Analysis of palm fruit value addition for socio-economic development in the Kwaebibirem District, Ghana

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Abstract

The study assessed the profitability of value addition in agricultural production especially; income and employment generated by adding value to palm fruits in the oil palm industry in the Kwaebibirem District, Ghana. Data for the study was derived from a sample of 40 respondents with an interview schedule. Descriptive statistics such as percentages, mean scores and frequency distributions were used to analyse the data. Respondents indicated that they obtain palm oil, palm kernel, sludge, fiber, and fermented palm oil by processing the palm fruits. The main profit generated from adding value to palm fruits is 259.88 litres (1 drum) of palm oil from one tonne of palm fruits. Processors generated average income of GH¢242.555 from the sale of 1 drum of palm oil. The profits made from adding value to palm fruits include employment and multiplier effects on the local economy. The income derived from adding value to palm fruits through processing was used to fulfil the following household needs: health, education and other socio-cultural needs. The study recommends that standard measuring instruments should be introduced to support farmer-processors to accrue profit from their activities.

Keywords: Value Addition, Oil Palm, Palm Oil, Processing, Kwaebibirem District

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Cite this article as: Sarku, R. and Appiah, D.O. (2017), "Analysis of palm fruit value addition for socio-economic development in the Kwaebibirem District, Ghana", *International Journal of Development and Sustainability*, Vol. 6 No. 4, pp. 149-167.

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1. Introduction

Agriculture helps to increase the socio-economic status of people all over the world; especially, the world's poor population who are dependent on it as their main source of livelihood (Kalu et al., 2006). The Ghana Living Standard Surveys (GLSS) conducted over the years have indicated that, poverty is dominant in agricultural sector (GSS, 1991, 2000, 2006, & 2014). The incidence of poverty in agricultural sector in Ghana is attributed mainly to the fact that traditionally, agricultural producers have been motivated by the need to increase production (Amoa-Awua, 2002). Hence, little value is added to agricultural produce (Awua, 2000). The effect is, most agricultural producers have not been able to raise the appropriate profit due to the sale of primary or semi-processed agricultural products (Amoa-Awua, 2002).

There is a growing call to support farmers in Ghana to develop innovative strategies such as value addition and value chain development in their productive activities (World Bank, 2006). This has become necessary because of the monetary value that can be generated from adding value to agricultural production to improve socio-economic wellbeing. Hence, the shift in focus from conventional extractive activities to innovative post-harvest activities like marketing, storage and transformation of agricultural products into consumable goods by farmers (Chege, 2012). Through the adoption of value addition strategies, agricultural producers will be able to generate more profit (Ngore et al., 2011).

Since the significance of value addition has been realised, there has been growing studies on value addition and value chain development in agricultural sector in Ghana (see for example: Leigh, 2002; Scholz, 2010; Adjei-Nsiah et al., 2012b; Ofusu-Budu and Sarpong, 2013; Ndidi et al., 2013; Mele and Buschmann, 2013). However, few of such studies have focused on the profitability of value addition in agricultural production especially, income and employment generation. Therefore, this study analyses the profitability of value addition in agricultural sector in Ghana with a case of palm fruit processing in the Kwaebibirem District, Ghana.

2. Literature review

Several meanings have been attributed to value addition in agriculture because it comprises many innovative activities which stems from producers creativity (Fairbairn and Gustafson, 2004). Value addition in agriculture connotes modifications, improvements, and enhancements of production, processing, and marketing activities (Flemming, 2005). Ernst and Wood (2011) also specified that value addition is not related to a specific activity because it is the result of the creative imagination of producers who may be responding to consumer's needs. The United States Department of Agriculture (USDA) (2002) defined value addition as: "(1) a modification of the state or form of a product; (2) the production of goods in a way that improves it value; (3) the physical segregation of an agricultural product in a way that results in boosting the value of a product". A modification of the USDA's (2002) definition by Amanor-Boadu (2003) states that, value addition is a business activity where particular members of a supply chain are rewarded for undertaking activities that are previously performed by industries downstream, or for accomplishing an activity that are deemed valuable but have been overlooked by producers. In support of this idea, Fairbairn and Gustafson (2004) indicated that, value addition

in agriculture involves new ways of using agricultural products. Based on the ideas identified in the definitions above, this study defines value addition as any innovative activity carried out by a farmer-processor that transforms a product a step closer to the form desired by a customer who is ready pay extra income for undertaking such an activity.

According to Ngore et al. (2011), value addition in agriculture is aimed at satisfying consumer's needs. Therefore, Evans (2012) asserted that value addition in agriculture is embedded in a consumer's perceived values. Coltrain et al. (2000) described the perceived values appreciated by consumers to include: quality, functionality, form, place, accessibility and time. Other values appreciated by consumers include price, variety, social, convenience, quality, safety, health and environmental consciousness.

Furthermore, Coltrain et al., (2000); Amnor-Boadu (2003) and Evans (2012) have identified characteristics of value addition as follows:

- It is consumer driven;
- Consumers are willing to pay premium on the value that has been added to a product;
- Value addition enhances a product and expands its market base; and
- Farmer-processors who add value in their production are able to derive premium from all the opportunities in the production chain.

Value addition in agriculture also enables equal opportunities to be derived by producers and consumers (Webber and Labaste, 2010). The rewards of value addition to producers are in the form of higher prices, increased market share or increased access to market (Amanor-Boadu, 2003). In summary, value addition in agriculture is different from the normal agricultural production. The succeeding questions enable agricultural producers to determine whether they are adding value or not. Is it consumer driven? Has the market base of a product increased? What is happening to profit? If these questions are not answered in the positive, then it is not value addition in agriculture (Evans, 2012). This idea about value addition is operationalised in the oil palm industry by examining how farmer-processors add value by responding to the specific needs of consumers.

3. Profile of the study area

Kwaebibirem Districts is located in the south-western part of the Eastern Region (Figure 1). It lies within latitude 6°22'N-latitude 5°75'S and longitude 1°0'W-longitude 0°35'E⁰ in the Eastern region. Kade is the district capital. It spreads over 1230 km². The district has a population of 113,721 persons according to the 2010 population census report (GSS, 2014). This translates into 27,650 household and an average of 4.1 persons per household. The area has a bimodal type of rainfall. The major rainfall period coincides with the main planting season (from mid-March-July), with peak rainfall record in June. The minor rains on the other hand occur between September to mid-December. Temperature range between a minimum of 23.5°C and a maximum of 33°C and relative humidity recorded during the major raining season is between 75%-80% whilst minor season records lowest range of 65% to 75%.

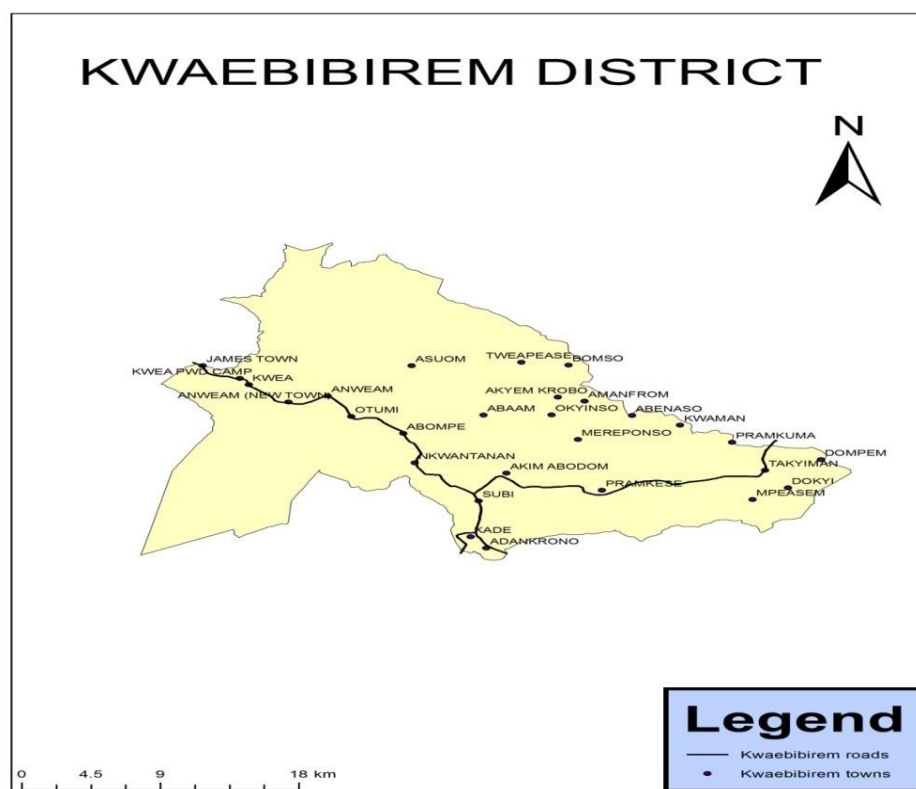


Figure 1. Map of Kwaebibirem District

The area is dominated by three types of soil namely, the *Bekwai-Oda*; *Birimean-Chichiwere*; and *Atiwa-Asikuma-Asum* associations developed over the lower *Birimean* soil type. There are about 72.2% of population from 15 years and above who are economically active. Out of this number, 95% are employed while 5% are unemployed. The distribution of the employed population is as follows: agriculture 39.6%, industry 11%, craft and related trade 15.2%, service and sales 19% and managers, professionals, and technicians 8.7% (GSS, 2014). The leading food crops cultivated in the district are maize, rice, cassava, cocoyam, vegetables among others (MOFA, 2015). The climate also favours the cultivation of cash crops like oil palm, cocoa, rubber, and citrus on smallholder basis. However, the main cash crops cultivated in the district are the oil palm, cocoa, and citrus (Kwaebibirem District Assembly, 2014). However, the oil palm is a dominant cash crop produce mainly by smallholder farmers. There are few medium scale oil palm plantations and processing mills in the district (Folds and Whitefield, 2012). Some smallholder farmers are part of the out-grower scheme operated by the Ghana Oil Palm Development Company (GOPDC) (Ofosu-Budu and Sarpong, 2013). The GOPDC also owns a large concession of oil palm plantation with processing mills and palm and kernel oil refinery in the district. The processing of palm oil and palm kernel oil from the palm fruit is mainly carried out by small scale women processors with assistance from men who provide various services in the mill (Sarku, 2016; Sarku, 2017).

4. Research methods

The study used interview schedule from a random sample of 40 farmer-processors in Kwaebibirem District, which is a major palm oil processing area in Ghana. Five towns were purposively selected for the study: Kwaie, Asuom, Abaam, Nkwantanang, and Kade. These communities were selected because Kwaie, Asuom, Abaam, and Nkwantanang lie within the catchment of Ghana Oil Plantation Development Company (GOPDC). The company manages the largest oil palm plantation in Ghana and in the district. The company introduces innovative value addition strategies in the oil palm industry and it employs most of its workers from the communities in its periphery (Ofosu-Budu and Sarpong, 2013). As a result, the probability that there will be diffusion of innovative value addition strategies to the selected communities is very high. Though, the intent is not to compare and analyse the origin of innovative value addition strategies among the selected communities. The fourth community, Kade, was also selected because it is the district capital and it hosts a weekly community market. Therefore, it is assumed that the influx of innovation into the community will be high because farmer-processors interact with customers and other actors from various locations. The duration of the study was February 2014 and March 2015. In-depth interviews were conducted with farmer-processors identified to be adding value in the study area. The respondents involved in the study were oil palm farmer-processors who obtained palm fruits from their farms and processors who buy from other farmers. This decision was taken to enable an analysis to be made on the profit made among various categories of value adders in the oil palm sector. From each town, 8 palm fruit processors were selected using a multistage random sampling technique. The analytical tools used in this study were descriptive statistics and profitability technique (Gross margin). A gross margin was used to measure the profitability of value addition activities.

Gross margin is expressed as:

$$GM = TR - TVC,$$

Where GM = Gross Margin;

TR = Total Revenue

And TVC = Total Variable Cost

5. Results and discussions

5.1. Value addition activities

Farmer-processors were engaged in a series of activities in the small scale sector which can be characterized as value addition according to Amanor-Boadu (2002). Figure 1 shows that 14% were involved in 3 chains of oil palm related activity; that is, oil palm farming, palm fruit and kernel processing; 44% were into oil palm farming and palm fruits processing; 24% were processing only palm fruits; 8% were processing palm fruits and kernel; 4% were engaged in processing palm fruits and trading palm oil; 8% were engaged in processing palm fruits and soap. From figure 1, it can be realized that some processors have taken the initiative to engage in series of activities which have led to the formation of a vertical chain. This enterprise, according to Coltrain

et al. (2000) is a value addition strategy because it enables a value adding actor to engage in all the opportunities within the production chain (Kalu et al., 2006). Furthermore, these value adding activities in the production chain could have been performed by other groups downstream but farmer-processors have taken hold of these opportunities in order to generate more income.

The total number of palm fruit processors who were oil palm farmers in table 1 is 65%. This implies that 35% of respondents were processing palm fruits and its related activities. Subsequently, the study sought to find out how many farmer-processors add value to proceeds from their farms. It was discovered that 35% of farmer-processors process all the fresh fruit bunches (FFBs) harvested from their farms, while 28% of farmer-processors process and sell some of the FFBs from their farms and 2% of farmer-processors indicated that they sell entire FFBs harvest from their farms. The fact that a low percentage of 2% of farmer-processors sell FFBs is a sign that processors were into value adding business because they were also processing fruits from their farms (Flemming, 2005).

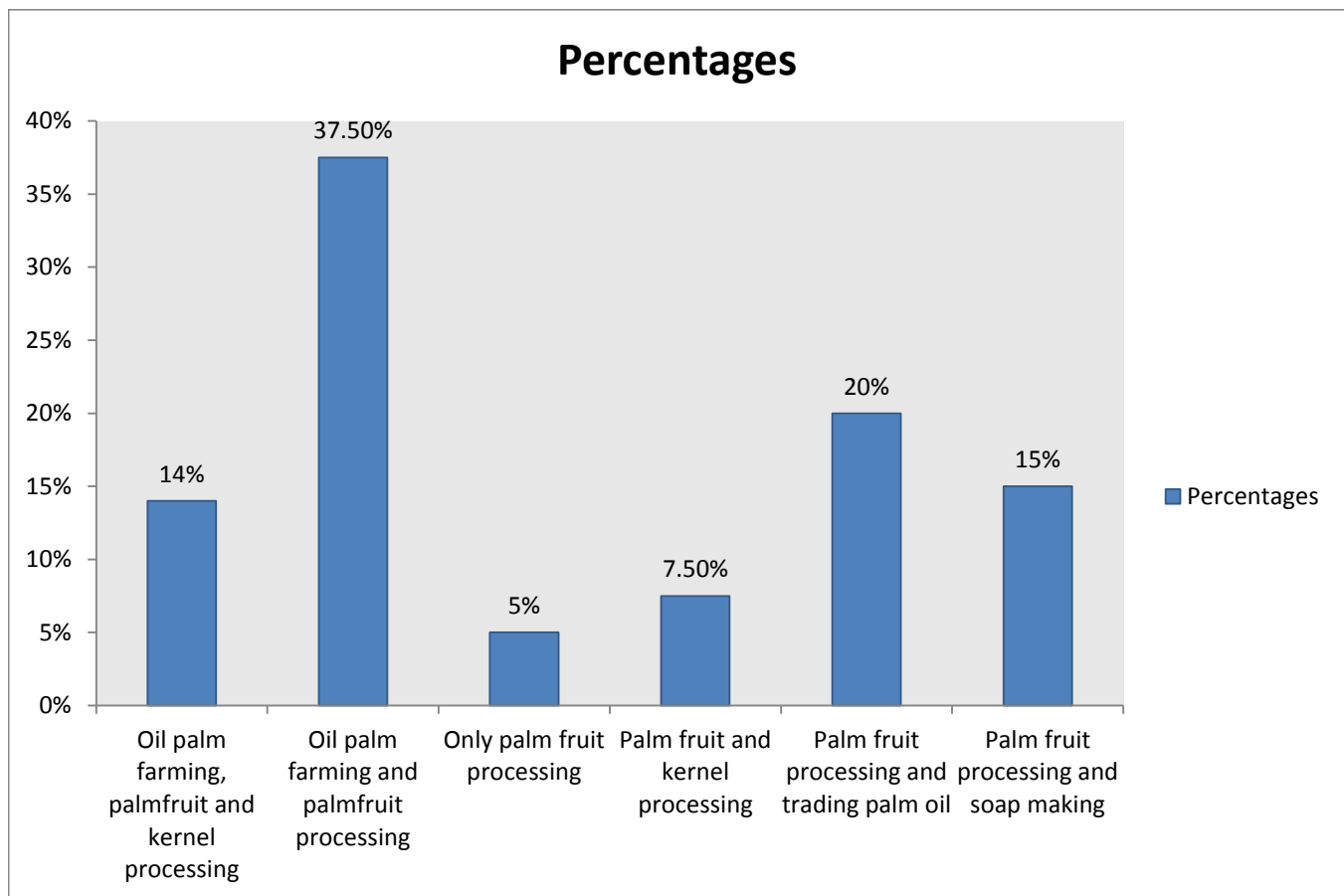


Figure 2. Chain of vertical value addition activities carried out by respondents

5.2. Benefits derived from value addition by farmer-processors

Palm fruit processors responses to the question of profits generated from value addition activities were rated as follows: 42% of processors indicated that 50% or more of their income is derived from adding value to palm fruits through processing. Whiles 28% of respondents indicated that they have been gainfully employed and 20% indicated that it has led to the growth of other industries and businesses in the study area (figure 3). The responses by oil palm farmer-processors were suggestive that value addition leads to diversities of opportunities in agricultural sector (Fairbairn and Gustafson, 2004). Respondent (10%) who choose other options indicated that the gains derived from adding value to palm fruits through processing were encompassing. In other words, they were able to generate income, employment and contribute to the growth of other industries. Some processors were of the view that the benefits, particularly, income and employment are the most significant advantages derived from the industry. The responses given on the benefits derived from value addition activities in the oil palm sector confirm Fleming's (2005) assertion that the phenomena contributes to increase income, employment generation and growth of other industries. The three key benefits derived from value addition are analyzed in detail in subsequent subsections.

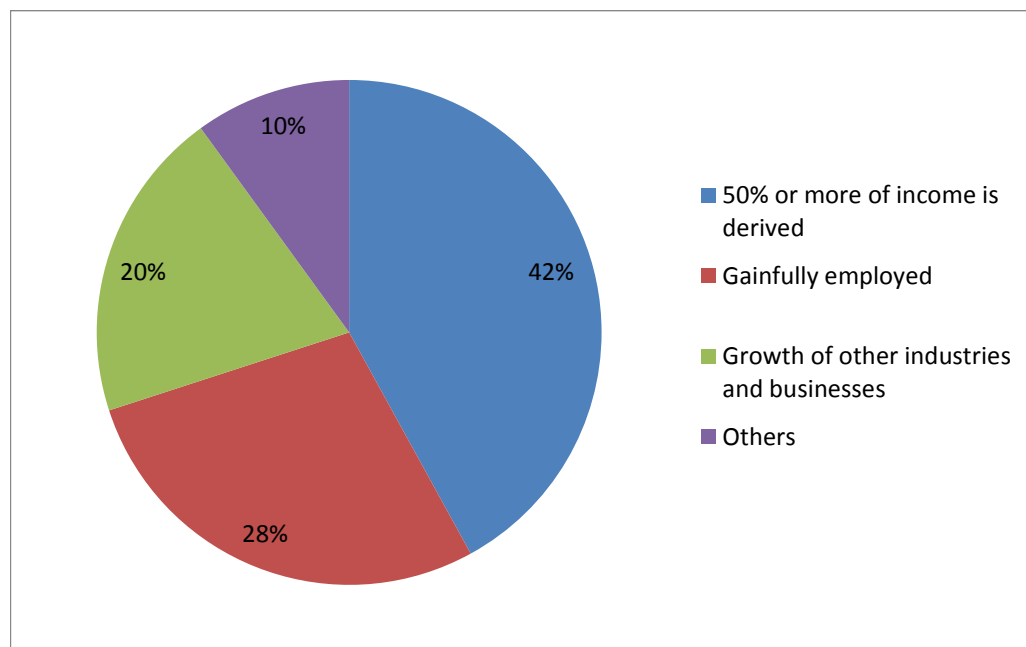


Figure3. Benefit derived from value addition

5.2.1. Economies of adding value to palm fruits through processing

Value addition in agriculture is in the form of packaging, cutting, smoking, processing, labeling, grinding, extracting, freezing, agri-farms, roadside marketing, farm festivals, community marketing and other innovative activities (Evans, 2012). But the common value addition practice identified in Kwaebibirem District which allows for easy quantification is processing. More so, processing of palm fruits is a process of value addition due to the fact that palm fruits are transformed at every stage until oil is generated.

In ascertaining the amount of money raised from this value addition strategy, the gross margin generated from one tonne of palm fruit was calculated. Since there was no formal scale to weigh palm fruits in small scale mills in the study area, estimations from local knowledge were made by farmers to identify the number of individual fresh fruit bunches (FFBs) that made up to a tonne of FFBs. Some estimated that eighty FFBs make one tonne, whiles other processors gave ranges between a hundred to one hundred and twenty FFBs as one tonne of FFB. The number of FFBs indicated as one tonne is dependent on the size of the FFBs or the thickness of the mesocarp. The cost for palm oil production (inputs, labor services, and energy) were deducted from the total revenue (table 1), and this resulted in an average gross margin of GH ₵ 242.55.

Table 1. Average Income generated from processing 1 tonne of palm fruit

Item	Amount (Ghana Cedis)
A. Returns	
Palm nuts (Average quantity of oil processed × Average price of oil)	510.255
Total returns	
B. Variable Cost	
Fresh fruits bunches (FFB)	201.50
Transport	29.50
Labour	32.07
Energy	4.63
Total variable cost	267.07
C. Gross margin (Total Returns - Total Variable Cost)	242.55

5.2.1.1. Storage of palm oil

Palm oil is distributed to consumers and processors mostly in three forms (figure 4) with their local names attached; 22.5 liters popularly called the 'Kuffour' or 'frytol' gallon, 62.5 liters ('Jerri' cans), and 250 liters (drum/tank). More (57%) processors were selling palm oil in 22.5 liter gallons because it was a sizeable form for traders to purchase. More so, it was used by processors who were engaged in retailing of palm oil. And so buyers could purchase the quantity that is commensurate with their income in their possession. Processors also reported that customers who transport palm oil to informal export market prefer to use the 22.5 liter gallons instead; so that, they could easily dispose their wares to customers. Few (14%) processors sold palm

oil in 250 liters (gallons) because they indicated that buyers bring it to the mill. Usually, when 250 liters (gallons) are used, then it suggest that customers were going to store palm oil and then sell it at a later time when prices are high. Hence, the mode of selling value added palm oil is a value addition strategy as farmer-processors respond to the needs of their customers.

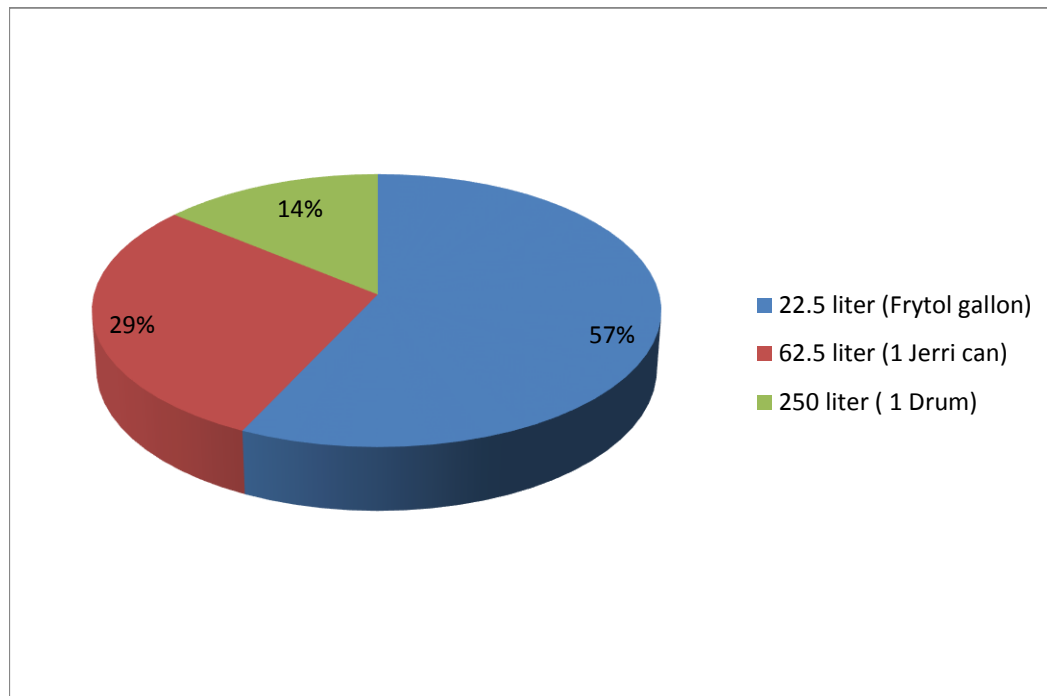


Figure 4. Ways of storing palm oil for distribution

5.2.1.2. Seasonal income generated from value addition

Processors were also asked to indicate the amount of palm oil that can be generated from a tonne of FFBs. Processors reported that the amount of crude palm oil generated were estimates, further reinforcing the idea that the use of a formal scale to weigh productions of processors were absent. The processors were also asked to illustrate the amount of money they receive from the sale of crude palm oil per season. Again, responses were based on processors recall rather than on recorded amounts of money. In the peak season (February-May), there is an abundance of palm fruits; hence, processors indicated that they were able to generate a lot of palm oil. Table 1 shows an average cost of processing 1 tonne of fresh fruit bunch (FFB) to be GH¢ 267.7. After processing 1 tonne of palm fruits, an average amount of 11.73 gallons (294.25 liters) of palm oil was generated. It was difficult to determine the equivalent of 1 tonne of FFB to the amount of crude palm oil generated because of the absence of a scale in all the mills. Therefore, average quantity of liters (gallons) was used as the standard unit for 1 tonne of crude palm oil produced in the Kwaebibirem District. However, ideally, when eight tones of

FFBs are processed, one tonne of crude palm oil is generated. And so, an average 294.25 liters (gallons) of palm oil generated was not equivalent to one tonne of crude palm oil.

In figure 5, the average selling price of palm oil in the lean season was GH¢ 66.93 and in the peak season, the average selling price of palm oil was GH¢ 43.50 per 22.5 liters (gallons). Since there is scarcity of palm fruits in the lean season, and demand for palm oil increases or even remains as it is in the peak season, palm oil is sold at a high price by producers. Furthermore, there are some variations in the per-liter price paid for palm oil over the course of the buying seasons. Besides, there were slight differences in per-liter of palm oil sold and in some instances, buyers have bargaining skills as well; so prices of palm oil could be lower than what has been agreed upon by all processors in a mill. The amount generated per season may vary per an individual processor. This finding underscores a fact stated by Fairbairn and Gustafson (2004) that when farmers add value, they are able to depend less on national and global prices before setting prices of their products. Table 2 presents the same basic information, but disaggregated according to season of production. This table shows that processors could earn an average income of GH¢ 510.25 and GH¢ 785.08 for the peak and lean season respectively.

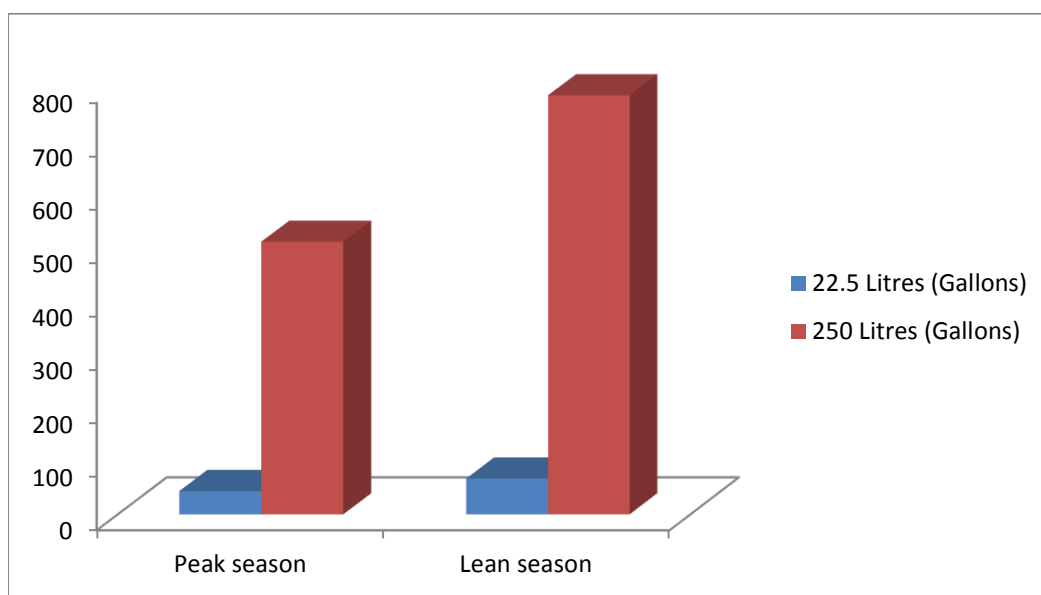


Figure 5. Income generated from sales of palm oil according to seasons of operations

5.2.1.3. Channels and strategies for palm oil marketing

Since value addition in agriculture entails that processors have direct contact with consumers, the study sought to find out the number of processors who produce directly to serve consumers or customers. Most (75%) processors were wholesalers; specifically, they only trade palm oil in the mill without having any direct connections with consumers. There were few (25%) processors who were retailers of palm oil because they have established linkages with customers in some urban markets. Besides, customers who mostly patronize

palm oil from Kwaebibirem District always buy directly from processors in the mill. Therefore, as the theory states that value-added processors are able to get first-hand information from consumers on what they want (Evans, 2012), it can be inferred that it is not every processor who is engaged in such initiative. Traders or middlemen were rather bearers of information on price, taste and preferences of palm oil from consumers to processors.

Value addition is always associated with a brand name (Ackermann, 2010) and in Kwaebibirem District; three main forms of palm oil were processed with three distinct brand names. These are crude palm oil also known as '*dzomi*', ordinary palm oil (*ngopaa*) and fermented palm oil (*saminango*, usually used for local soap production). Each type of oil has its characteristic and the price paid for it. '*dzomi*' and '*ngopaa*' are used mostly for preparing local dishes but the most preferred among the two is '*dzomi*' because it is assumed to have a salty and flavoured taste with good aroma. '*Saminango*' is regarded as local oil produced for making soap. As a result of consumer preferences attached to '*dzomi*', its price is usually GH¢10 more than the '*ngopaa*' and '*saminango*'. Therefore, when processors want to make more money, they turn to produce '*dzomi*' especially in the peak season. From figure 6, 25% of processors were solely producing '*dzomi*', 28% '*ngopaa*', 5% '*saminango*' and 43% of processors were producing '*dzomi*' and '*ngopaa*' based on specifications given by their customers.

The production practices of palm fruit processors in Kwaebibirem District conforms with Fairbairn and Gustafson (2004) assertion that value addition has the potential to stabilize income during lean seasons through altering of production processes, recycling and reuse of waste to generate new products. This is important because during lean seasons, farmers have little income generating activities to undertake (Scholz, 2010). Hence, value addition enables farmer-processors to have competitive advantage over other producers through flow of income during off seasons (Chege, 2012).

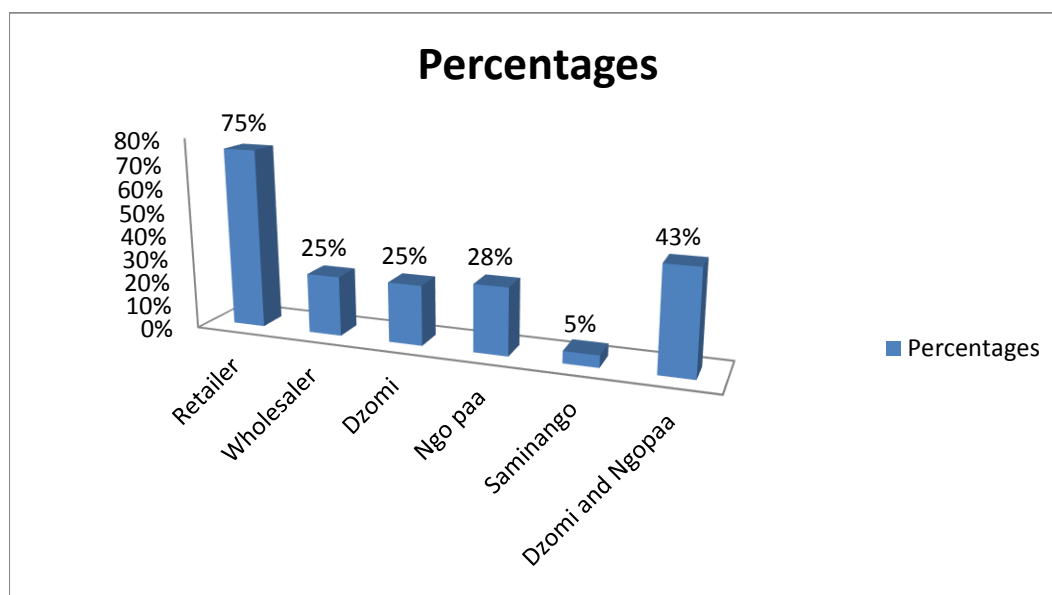


Figure 6. Distribution of value added marketing strategies adopted by processors

In addition, processors in the Kwaebibirem District seem to have understood Zimmerman's (1951) conception of resources as: 'resources are not they become', because they make use of every waste from their production chain. For instance, the kernels, fibers and fermented oil were generated from the pressed palm cakes. These were separated into different sections and then sold to other processors. Table 2 indicates that apart from the sale of palm oil, other items such as the sludge, fermented oil, fibers, and kernels were sold to generate income. It can be deduced that it is more advantageous to add value to FFBs by processing it as the value of palm fruits increases according to the season of production and the type of oil produced.

Table 2. Output of various value addition activities for processing 1 tonne of palm fruit

Economies of activities	Value addition activities involved in processing palm fruits			
	Palm fruit processing	Clarification of oil	Pressing second grade oil from mesocarp fibers	Sorting kernel
Cost of operation	¢267.7	¢1.55	¢ 1.95	¢ 4.30
Output	Palm oil	Sludge	Palm oil and fiber	Palm kernel
Selling price of output	¢510.25	¢2.40	¢39.88	¢148.75
Total value of activity	¢ 242.55	¢ 0.85	¢ 37.93	¢ 144.45

Evans (2012) posited that in value adding activities, farmers diversify their activities to retain most of the income in the production chain. This results in increase demand for additional hands from the household or community; thereby reducing unemployment and underemployment situations in rural areas (Fairbairn and Gustafson, 2004).

5.2.2. Employment creation

Another benefit derived from adding value to palm fruits through processing is employment creation. Results indicates that palm fruits processors employed average number of 8 people to help process 1 tonne of palm fruits; though, some household members were sometimes engaged in some activities in the mill. Interviews revealed that the quantity of FFB and type of palm oil to be processed determines the number of people they employ. Subsequently, information from interviews and FDGs were also used to support finding on the number of people employed at each stage of the production chain (Table 4). The response generated from FDG revealed that value addition through processing of palm fruits has the ability to create employment for about 10-34 people. Those employed to assist processors are labourers, caretakers, sub-agents, agents and traders.

Table 3. Number of people employed to process palm fruits

Activities	Number of people employed	Gender of people involved
Carrying FFBs from truck to shed	3	Men/women
Splitting of FFBs	1	Men
Removal of fruits from spikelet	4	Women
Loading fruits into boiler	4	Men/women
Fetching water	2	Women
Boiling	1	Men/women
Carrying boiled fruits to digester	6	Men/women
Digesting and pressing	4	Men
Carrying pressed oil	2	Women
Sorting of kernels from fiber	4	Women
Clarifying the pressed oil	2	Women
Packaging oil	1	Women
Total number	34	

5.2.2.1. Effects of employment and income on palm fruits value addition

Respondents further indicated that income generated from processing palm fruits as a value added strategy were used for: purchasing food for their households (32%); healthcare needs (22%); educational needs (33%); and other socioeconomic needs (13%) such as paying back credits, buying household assets and others (figure 7). Respondents, who choose the option captioned others, specified that they use the income to pay rent and utilities, fulfill ceremonial and religious duties. Thus, value addition has multiple socio-economic dimensions such as increase income which leads to creation of wealth and acts as a tool for rural development.

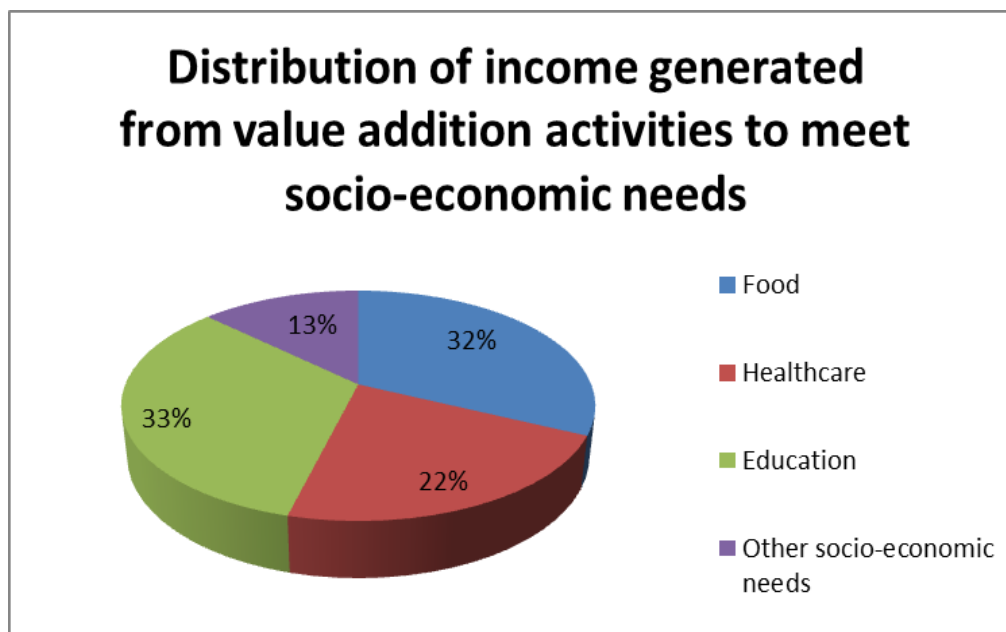


Figure 7. Distribution of income to meet socio-economic needs

5.2.2.2. Growth of other industries

Rural economy is characterized with agriculture and its related activities (Ngore et al., 2011) and through value addition initiatives; producers are able to diversify the economy of rural communities (Ernst and Wood, 2011). The multiplier effects of diversities of opportunities offered to producers are mostly in the form of creation of employment for people operating in financial institutions, logistics, transport, communication, catering, artisan, and other areas in rural communities (Fairbairn and Gustafson, 2004).

Processors in Kwaebibirem District were also asked to indicate the industries or businesses with which they were connected to for the purpose of purchasing and supplying of goods in their daily activities in the mill. They indicated that they have established networks with operators of different business activities sectors in the study area. The percentage distribution of these linkages is as follows (figure 8): transport sector (22%), mechanics industries (35%), and engineering and fabrication industries (30%). Other respondents (13%) indicated that they had connections with local manufacturing industries like soap making factories. Some respondents elaborated that they use their phone to make calls to contact their customers and so they help the telecommunication industry to also grow. Other industrial sectors cited by processors were banking and financial institutions, manufacturing sector, building and construction industries. Some processors added that through their activities they have contributed to transaction of businesses with a lot of industries which transcends beyond the study area to the wider economy in Ghana and abroad.

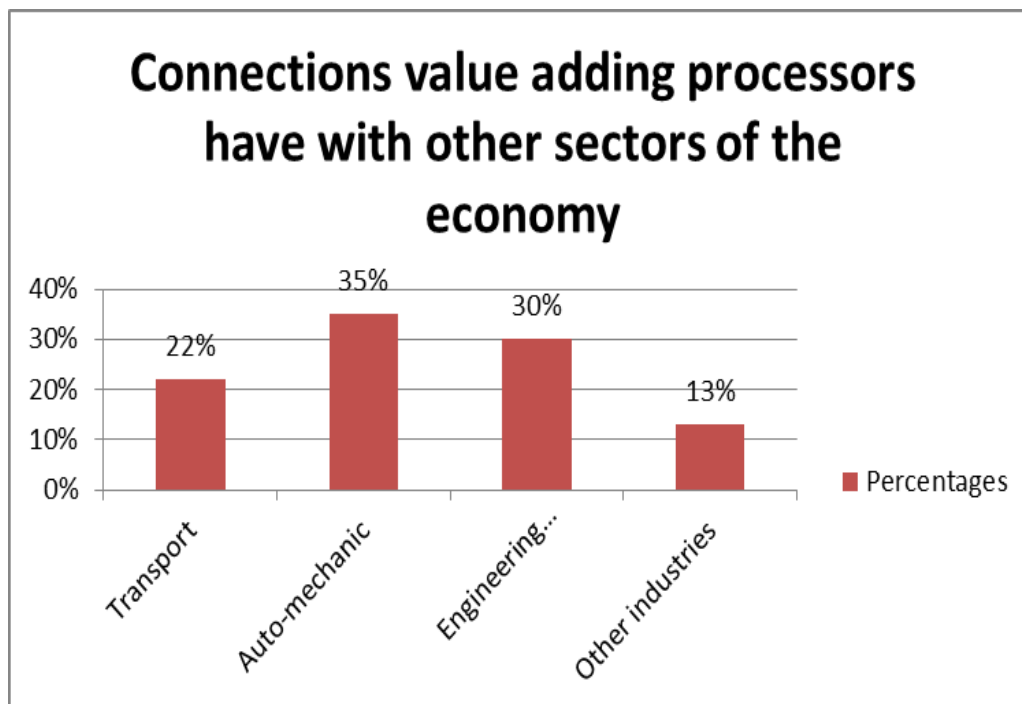


Figure 8. Connections established with other industries as a result of value addition

The foregoing discussion on the benefits and the uses of income derived from processing, packaging and marketing palm fruits and kernels as value addition strategies implies that rural women and men will be empowered economically to meet their family needs. Response generated from an interview with a value adding farmer and processor summaries the benefits that can be generated from value addition to palm fruits in the oil palm industry:

"When I harvest one tonne of palm fruit from my farm, I am able to generate one 'drum' of palm oil from it. If I had sold it to other processors, I would have raised about GH¢ 180-200. Apart from the palm oil I generate from 1 tonne of palm fruits, I get the following items as by-products: sludge, fibre, palm kernels, fermented palm oil. Each of these items has a price. For instance, as I speak currently, I sell one 'Kuffour' gallon of fermented palm oil at GH¢ 40. The sludge is purchased by a company at GH¢ 2 per 22.5 liters and I also sell a tonne of kernel at GH¢ 150. Apart from these, I sell the palm oil at the local markets in the district myself. I do this by pouring the oil in mini bottles sometimes the size of a 'volitic' water bottle (used 1.5 litre bottle). As I do this, I generate about 50 bottles of palm oil from one 'Kuffour' gallon which I sell at GH¢ 1.50. So instead of selling 'Kuffour' gallon at GH¢ 450, I earn more than that amount. What I do is that I print some papers that state my address. I believe that through my activity, I am able to contribute to the local economy because on every market day, I buy bottles from various shops. This way I create employment for the woman in the shop and the manufacturer of the bottles in Accra. The one who also print the stickers for me get employed and income as well. Since I am involved in selling my own palm oil in

some local market centres in the district and other areas, I have employed about five people to assist me in bottling, sale, and distribution of the palm oil to my customers”.

6. Conclusion and recommendations

Result from the study shows that farmer-processors were engaged in chain of productive activities which are value added initiatives. Respondents either obtained palm fruits from their own farms or from other farmers. Through adoption of processing as value addition strategy, processors obtain palm oil, palm kernel, sludge, and fermented palm oil from their activities. The profitability of adding value to palm fruits include: income, employment and development of other industries in the local economy.

Findings from the study also indicates that every processor was engaged in some form of value addition activity. However, analysis of series of value adding initiatives carried out by processors indicates that some were engaged in more than one value addition activities in the oil palm value chain. The various categories of value adding processors identified in the study include:

- Processors engaged in only palm fruit processing
- Processors of palm fruits and kernels processors
- Processors of palm fruit, kernel and retailers of palm oil
- Processors of palm fruit, kernel, retailers of palm oil and recycle waste for sale and
- Processors of palm fruit, kernel, retailers of palm oil and recycle waste for sale and the production of variety of palm oil with different income values.
- Processors of palm fruit, kernel, retailers of palm oil and recycle waste for sale and the production of variety of palm oil with different income values and also use fermented palm oil to produce local soap for sale.

Though the income generated by each category of value-added was not analysed, from table 1, 2, and Figure 5, it can be concluded that processors generate income from every value addition strategy they adopt. Those who add multiple value to the fruit and adopt innovative marketing strategies may generate high profit margins than those who were engaged in a single value addition activity. As processors continue to add value to by-products such as palm kernels, fermented palm oil, and sludge, the income level also increases progressively. Some of the benefits derived from value addition activities consist of the use of the income to meet educational, health, and other socio-economics needs. Also, value addition in the oil palm industry has resulted in the growth of other industries in the district and in the country.

The study recommends that the district assembly valuation board should introduce appropriate or standard scale to ensure accurate assessment of actual income derived from their palm fruit processing activities. This would enhance the Gross Regional Product (GRP) accounting. The district assembly through the auspices of National Board for Small Scale Industries (NBSSI) should train farmer-processors to participate in innovative value addition activities such as soap making and branding of oil palm related products. Training should also be organised on innovative ways by which processors could be engage in value added marketing

strategies. Farmer-processors should also be assisted to form cooperatives to enable farmer processors set standard prices for their products.

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