
Chapter 11

Oil palm industry growth in Africa: A value chain and smallholders' study for Ghana*

Kwabena Ofosu-BUDU and Daniel Bruce SARPONG¹

*Correct citation: Ofosu-Budu, K., and D. Sarpong (2013), ***Oil palm industry growth in Africa: A value chain and smallholders study for Ghana***, In: *Rebuilding West Africa's Food Potential*, A. Elbehri (ed.), FAO/IFAD.

¹ Authors are professors at the College of Agriculture & Consumer Sciences at the University of Ghana, Legon-Accra. The chapter is based on a study commissioned by the Trade and Markets Division (EST), Food and Agriculture Organization. The authors acknowledge the contributions of Aziz Elbehri and Suffyan Koroma (FAO) in defining the study terms of references and providing guidance and reviews through several drafts.

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1. Introduction and motivation

Oil palm is native to West Africa. The West African region – especially Côte d'Ivoire, Ghana, Nigeria and Sierra Leone – is a major producer of both palm oil and palm kernel oil (PKO). However, because of internal marketing and supply-side constraints, as well as subsidies for commercial and food aid imports of competing vegetable oils, domestic availability of palm oil has not always been reliable. The consumption of palm oil and other palm products is expected to increase in West Africa and in other parts of the continent as the population grows. In many countries, the palm oil sector has a significant economic impact. In Nigeria, the palm oil industry employs millions of workers, while in Guinea, Liberia and Sierra Leone it is a major source of income and trade along the common border districts.

Oil palm serves as a raw material for industry and a source of foreign exchange. Production of palm oil now accounts for 37 percent of the total global output of oilseeds, overtaking soybean oil as the leading vegetable oil. Malaysia and Indonesia dominate world production and trade with 90 percent of global output, while West Africa accounts for a negligible 3.5 percent.

Given a per capita edible oil consumption of 10-11 kg, and if all edible oil were supplied by crude palm oil (CPO), the population of West Africa would require about 2 million metric tonnes (MT) of CPO to be self-sufficient. However, total supply is currently 1.4 million MT, leaving a demand gap of 600 000 MT, which is currently filled by imports. The global palm oil industry has recently witnessed unprecedented growth, with a cumulative annual growth rate (CAGR) of 8 percent, although West Africa's CAGR is at 1.5 percent. The competitive landscape is dominated by Southeast Asian producers who have better production efficiency (higher productivity at comparable costs of production, hence able to capture larger shares of the world market) and ideal climatic conditions, resulting in loss of revenue opportunity for producers in West Africa.

Many West African countries (and countries in other parts of Africa) have plans to expand and develop oil palm plantations. Buoyed by rising producer prices, strong international demand for vegetable oil and the large demand potential within Africa, as well as demand from biofuel markets, several West Africa countries have formulated national programs to encourage both national and foreign investments in new oil palm plantations.

There appears to be a continuous diversion of crops away from citrus, formerly a major tree crop in the region. Citrus trees are being cut down by producers in order to replant the land with oil palm because there is a lack of ready market for citrus and very little profit margin at the end of the year, compared with oil palm.

The oil palm industry is characterized by various types of agro-systems, ranging from large agro-industry plantations to small-scale farmers, who may or may not be organized into cooperatives. Several supply models also co-exist, from fully integrated agro-industry companies with oil mills which procure from their own plantations, to outgrower schemes, to small-scale producers – primarily women – who either sell fruit to processors, or produce oil for their own consumption or for sale to local markets. The local industry contends with a number of constraints, including little demand-driven research, limited access to land and finance, high production costs, low levels of technology, low extraction rates and poor quality CPO, and lack of adequate government support.

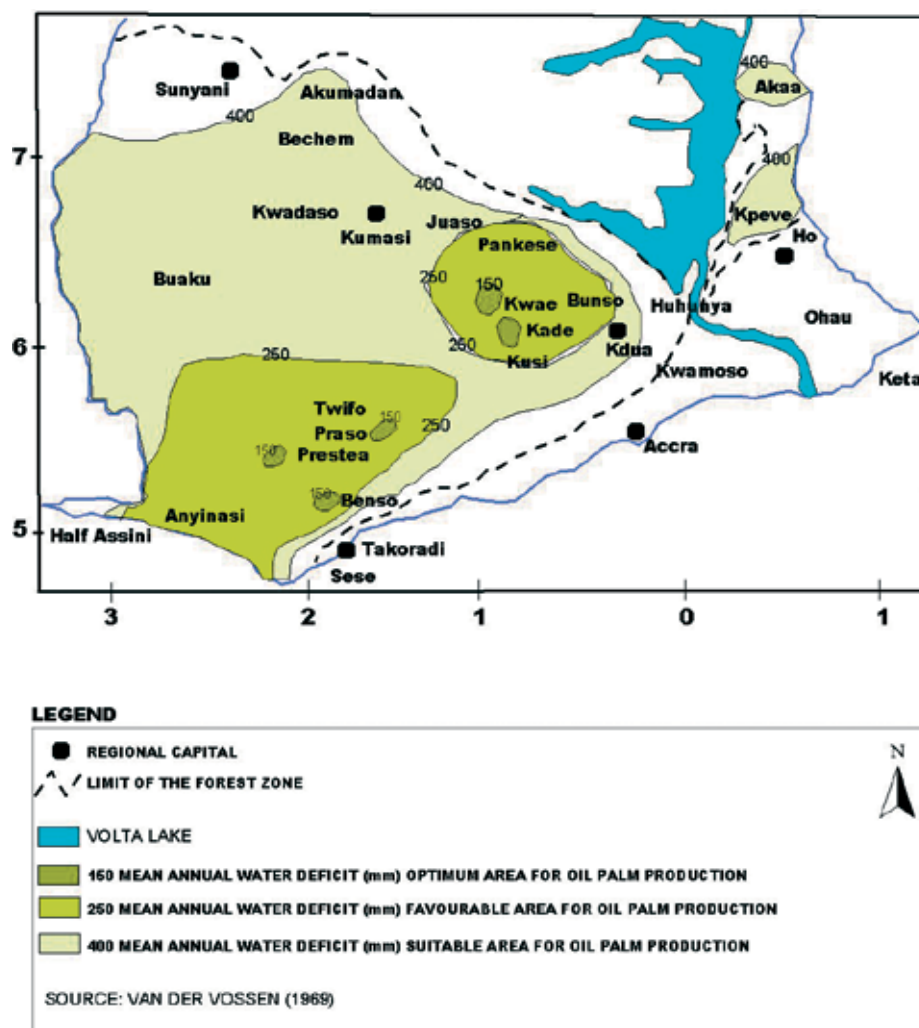
Some African governments are targeting oil palm as a key sector for agricultural growth and to address rural poverty. However, the sector's current expansion is driven largely by large-scale agro-industry and

favors large plantations for economies of scale, which raises the question of whether and to what extent small-scale farmers, including women, can successfully compete, capture a share of the value addition of the growing sector and improve their incomes.

Oil palm is grown in the forest belt in Ghana, where the rainfall amount is greater than 1200 mm/annum and distributed in a bimodal fashion. The most suitable areas for oil palm cultivation in Ghana are in the Western, Central and Eastern Regions. Large oil palm plantations (nucleus estates and outgrowers) and processing mills are located in these regions. Some of the large-scale plantations are Benso Oil Palm Limited (BOPP) and Norwegian Oil Palm Ghana Limited (NORPALM) in the Western Region, Twifo Oil Palm Plantation Limited (TOPP) in the Central Region, and the Ghana Oil Palm Development Company (GOPDC) at Kwae near Kade in the Eastern Region (see Figure 1).

At present, it is estimated that Ghana has more than 150 000 ha of wild groves of (*Dura*) oil palm, as well as approximately 140 000 ha in private, unorganized small holdings, and some 40 000 ha in estates with smallholder and outgrower schemes. The total estimated area of oil palm in the country is 330 000 ha (MoFA, 2010).²

Figure 1. Map of Ghana Showing the Oil Palm Growing Areas



² MoFA (2010). MASDAR: Master Plan Study on the Oil Palm Industry in Ghana. November, p. 1.2.

In areas where the crop grows well, oil palm production can ensure food and livelihood security for many farmers and communities. In addition, it offers a livelihood to other value chain players, such as transporters and agro-input sellers who are outside the production areas. There is a wide variation in the productivity of oil palm reported by various sources. The level of productivity in the small scale sector is about a fourth of the productivity on estates, and a third of the productivity on the outgrower farms. Large estates achieve a productivity level of 10-13 tonnes/ha; smallholder outgrowers produce about 7-10 tonnes/ha and private small-scale producers obtain about 3 tonnes/ha. The key factors responsible for low productivity on private small-scale farms include old, low-producing tree stock, poor maintenance, lack of application of fertilizers and often lack of establishment of cover crops.

Ghana's CPO output of 242 130 MT is less than 1 percent of global output of 46 million MT. World price of palm oil has improved from USD 350/MT in the 1990s to a high of USD 1 020/MT by December 2011, making it profitable to cultivate oil palm even at a production cost of USD 350/MT for Asian producers and USD 400-450/MT for Ghanaian producers, who were expected to obtain a margin of USD 70 million in 2010.

Ghana's palm oil industry is characterized by large-, medium- and small-scale operators engaged in production, processing and marketing. The industrial use sub-sector consists of medium and large scale oil palm plantations and mills. It has more efficient technology, economies of scale, higher productivity on farms (in terms of yields of oil palm bunches) and in mills (in terms of quantity of oil extracted), and by its better quality of CPO, as well as further refined palm oil products, which are sold to companies for use in manufacturing. Large plantations use 20 percent of available land to produce 55 percent of national CPO output, while medium-scale producers use 5 percent of land to produce 5 percent of CPO. Small producers, on the other hand, use 77 percent of land to produce 39 percent of national output.

The main objective of this study is to conduct a value chain and smallholders' study on growth of the oil palm industry in Africa, with a particular focus on Ghana, and its implications for small farmers.

The key question in this chapter is whether an expanding oil palm sector can be inclusive of smallholders. The answer requires examining policies and investment strategies, as well as the types of institutional and contractual arrangements between processors and producers/suppliers, including the role of small farmer groups.

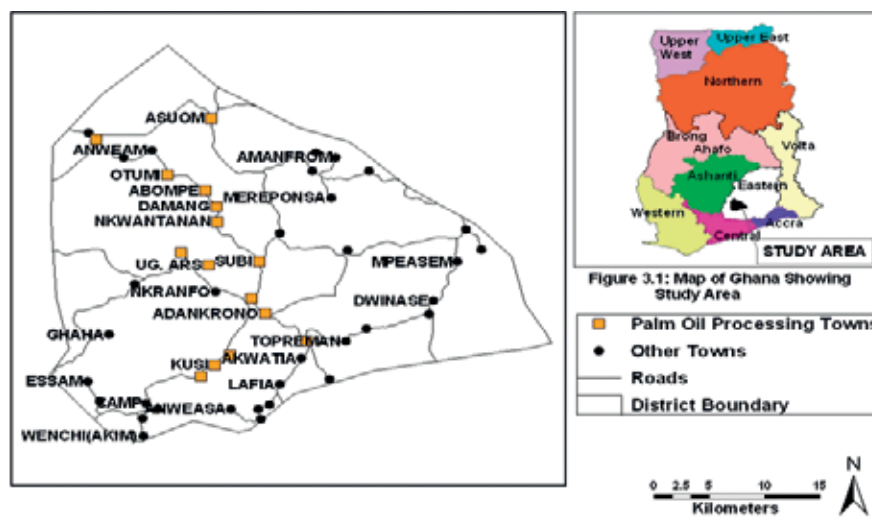
2. Methodology and data collection

The Kwaebibirem District in the Eastern Region of Ghana was the focus of the study. Ghana Oil Palm Development Company (GOPDC) owns and manages approximately 20 500 hectares (ha) of oil palm plantation in this district, divided between Kwaeb and Okumaning estates. The Kwaebibirem District includes both large-scale, outgrower schemes linked with large producers/processors and smallholders selling onto the local market. For example, about 6 500 ha of oil palm production in the district is directly run by GOPDC staff (approximately 280 people), while 14 000 ha is cultivated by a body of 7 000 outgrowers who own land located within 30 km of the oil palm mill at Kwaeb estate. GOPDC assists outgrowers in the development of their plantations and they sell their fruits to the company.

To understand the household production and market structures for smallholder oil palm producers, five focus group discussions (FGDs) were held with producers and two FGDs with processors in five oil palm producing communities at Damang, Nkwantanang, Kwaeb, Anweam and Otumi. In addition, about 60

individual smallholder farmers, processors and marketers were interviewed in nine communities in the district, using structured questionnaires and interview guides/checklists. The study also held detailed focused discussions with individual producers, processors and marketers, as well as with one large-scale oil palm estate and one palm kernel processor in the district: GOPDC (Kwae) and WAML Industries Limited (Nkwantanang), respectively. See Figure 2 for the detailed locations of smallholders interviewed for the study.

Figure 2. Map of Ghana Showing the Study Area in the Oil Palm Growing Zone



Source: MofA (2010)

Additional information was gained through a review of literature and existing policy documents and the analysis of secondary information.

Data from the survey questionnaires were edited, coded and entered into the Statistical Package for Social Science (SPSS) and analysed quantitatively. Data from observations and interview recordings were analysed using qualitative data analysis methods (content analyses).

3. Significance of oil palm in Ghana and West Africa

3.1 Importance of palm oil and derivative products as sources of vegetable oils for consumers and industries

The oil palm is the second most important tree crop in the Ghanaian economy after cocoa. It is therefore one of the leading cash crops in the rural economy in the forest belt of Ghana. Oil palm, an essential oilseed, produces many products both for domestic consumption and as inputs for the industrial sector. The structure of the palm oil industry in Ghana has been shaped by the presence of two different markets: home consumption and industrial use in domestic manufacturing. As a result, Ghana's industry has two sub-sectors which are largely separate.

The industry provides income for many rural people who work in large and small scale mills, especially women engaged in small scale palm oil processing. The small-scale sub-sector consists of private smallholder oil palm cultivators, who largely sell their fruit bunches to small-scale mills or to household (largely manual) processors. This sub-sector is characterized by low-yielding oil palm varieties, low productivity of farms and mills, and low quality CPO, which is sold in the village or at small town markets.

The principal product of oil palm is the palm fruit, which is processed to obtain commercial products including palm oil, PKO and palm kernel cake. Palm oil and PKO have a wide range of applications. Recently, CPO has emerged as biofuel, an alternative source of energy. The processing of CPO gives rise to three different products: food products (cooking oil, margarine, etc.); manufactured/industrial goods (cosmetics, soaps/detergents, etc.); and fuel (biodiesel).

Among the food uses, refined, bleached and deodorized (RBD) olein is used mainly for cooking and frying oils, shortening and margarine, while RBD stearin is used for the production of shortening and margarine. RBD palm oil (unfractionated palm oil) is used for producing margarine, shortening, vegetable ghee, frying fats and ice cream. Several blends have been developed to produce solid fats with a zero content of trans-fatty acids. In the production of ice cream, milk fats are replaced by a combination of palm oil and PKO. A blend of palm oil, PKO and other fats also replaces milk fat for the production of non-dairy creamers or whiteners.

Palm oil is the largest natural source of essential vitamin E, and is high in vitamin K and dietary magnesium. Palm oil and PKO are also ingredients for the production of specialty fats, which include cocoa butter equivalents (CBE) and cocoa butter substitutes (CBS) and general purpose coating fats. CBE and CBS have physical properties that are similar to cocoa butter and are widely used for production of chocolate confectionery.

Non-food uses of palm oil and PKO are for the soap, detergent and cosmetic industries. They are also used in the chemical industry for plasticizers and coatings. A recent trend is the usage of by-products, as well as CPO, as energy sources for electricity plants and increasingly as biofuel and biodiesel. By-products include palm kernel cake, fruit chaff, mesocarp fibre, palm kernel shells, empty fruit bunches and palm oil mill effluent.

Ghana exports, as well as imports, various kinds of vegetable oils, which are used for both industrial and domestic purposes. Import volumes have been generally increasing over the years compared with export volumes; groundnut oil, for instance, has seen substantial decrease in exports over the year.

Table 1. Share of Palm Oil Related Products in Total Demand: Ghana and West Africa

Product	Share of product in Ghana demand (%)	Share of product in West Africa demand (%)
Laundry Soaps	34.5	32.1
Personal wash	4.6	4.3
Fat & Margarine	8.0	8.8
Refined Cooking Oil (Ind.)	12.3	17.1
Edible Palm Oil	40.6	37.7
Total		

Source: Percentages computed from PSI Annual Report (2009).

The demand for oil palm derivatives in Ghana and the sub-region is shown in Table 1. Palm oil as vegetable oil (fat and margarine, refined cooking oil and edible oil) constitutes almost 61 percent of the palm oil-related product demand in Ghana, and about 65 percent of the total demand in West Africa. There is an insufficient supply of palm oil products in Ghana and the sub-region to meet demand requirements. Ghana currently has a total of 305 758 ha of oil palm, more than 80 percent of which is cultivated by private small-scale farmers. It is estimated that 243 852 tonnes of palm oil is being produced and that Ghana currently has an unmet demand of 35 000 tonnes of palm oil.

There are two main oil palm varieties cultivated in Ghana: the *Dura* and the *Tenera*. The bulk of the smallholder holdings under oil palm are the *Dura*. However, the high level of unsaturation in the *Dura* makes it nutritionally preferable to the *Tenera*. The oil from the *Dura* is therefore more preferred for food. It is indicated that palm oil from red *Tenera* has higher palmitic acid content than red *Dura* palm oil (RDPO), while oleic acid content is higher in the red *Dura*. Significant differences are observed between palm oils from the red and yellow fruits of the same variety and the mean total fatty acid content of the *Dura* is richer in unsaturated fatty acids than the *Tenera* varieties.³ Since the level of saturation is affected by the environment where the oil palm is grown, a careful selection of planting location is necessary, if a high unsaturation to saturation ratio is desired. In addition, there are reported significant differences in free fatty acid (FFA) content of palm oils from the red and yellow *Dura* and *Tenera* fruits. The FFA is higher in the *Dura* red palm oil than in the *Tenera* red palm oil while essentially equal amounts have been recorded for the yellow fruits of the two varieties.

3.2 Palm oil and other oil palm products demand in Ghana and the Sub-region

In 2010, Ghana imported about 112 000 MT of vegetable oil, of which almost 45 percent was palm oil (crude and refined). (See Table 6 for Ghana exports and imports). At current population projections, about 260 000 MT were needed for consumption in 2011, of which about 160 000 MT “were estimated to be produced locally, giving a shortfall of about 100 000 MT.

Table 2. Sub-regional Production and Consumption of Palm Oil in 2007

	Production	Import	Total Supply	Export	Food	Other Utility	Waste	Consumption	GAP
Benin	40	210	250	198	42	10	0	52	-12
Cameroun	172	28	200	0	95	99	6	200	-28
Côte d'Ivoire	289	6	295	121	180	5	0	185	104
Ghana	109	170	279	92	62	135	0	197	-88
Guinea	50	29	79	0	61	18	0	79	-29
Liberia	44	16	60	0	49	11	0	60	-16
Nigeria	1 300	390	1 690	15	736	890	50	1676	-376
Sierra Leone	36	9	45	0	44	5	0	49	-13
Togo	7	15	22	2	22	22	0	44	-37
TOTAL	2 047	873	2 920	428	1 291	1 195	56	2 542	-495

Source : FAOSTAT, 2011

³ Ekpa, O. D., Fabara, E. P. and Morah, F. N. I. (1994) Variation in Fatty Acid Composition of Palm Oils from Two Varieties of the Oil Palm (*Elaeisguineensis*) J. Sci. Food Agric. 64 483-486;
Ekpa, O. D., Akpanabiato, M. I., Amelio, M. and Rizzo, R (2001b) A Comparative Study of the Triglyceride and Fatty Acid Compositions of Palm Oil from Plantations in South-Eastern Nigeria. *Global J. Pure & Applied Sci.* 7:61-65

Table 2 shows an estimated sub-regional gap of 495 000 MT of oil palm between consumption and production⁴ for 2007 (TOR oil palm, 2011). These countries imported about 873 000 MT of palm oil and exported 428 000 MT in the same period. The only country that produced more than it consumed was Côte d'Ivoire in 2007.

Table 3. The Importation of Palm Oil in the Sub-region (2008)

Targeted countries	Quantity (1000 tonnes)	Value (million USD)	Unit value (\$/tonne)
Benin	225	202	900
Nigeria	464	539	1160
Côte d'Ivoire	0	0	0
Cameroon	43	25	579
Liberia	14	12	911
Sierra Leone	9	11	1258
Guinea	22	9	405
Togo	64	20	321
TOTAL	841	818	

Source : FAOSTAT, 2011

In 2008, the countries in the sub-region spent over USD 818 million to import 841 000 tonnes of palm oil (Table 3). Nigeria alone spent as much as USD 539 million to import palm oil in 2008. Table 4 shows that Nigeria's imports of palm oil in 2011 were not significantly different from 2008. All these oil palm producing countries in the sub-region exhibit shortfalls in meeting demand from domestic production, with Nigeria imports alone exceeding the exports of Ghana and Côte d'Ivoire.

Table 4. Palm Oil and PKO Demand in 2011: Ghana, Nigeria and Côte d'Ivoire (1000 MT)

	Ghana					Nigeria				
	Total Supply	Exports	Imports	Food Use Domestic consumption	Industrial Domestic consumption	Total Supply	Exports	Imports	Food Use Domestic consumption	Industrial Domestic consumption
2011										
Palm Oil	304	100	150	180	174*	1388	18	440	1050	235
Palm kernel oil	18	10	2	8	0	310	4	0	215	86

Source: Index Mundi (www.indexmundi.com/agriculture: accessed June 2012)

Notes: * Estimated from data on total supply, exports, imports and food.

Nigeria provides a huge domestic market for PKO. There is therefore a growing demand for CPO, not only in Ghana but in the entire sub-region. In West Africa alone, there is an intra-region market close to 2 million MT a year. For instance, it is reported that Malaysia has installed CPO silos in Ghana to export to the Nigerian market. The Food and Agriculture Organization indicates that in the medium term (2005-2015) world vegetable oil demand will rise to 30 percent of the vegetable oil market. A major part of this world demand will be for palm oil. Ghana thus has the opportunity to explore this versatile sector by further developing its oil palm industry to meet the growing market interest in oil palm products and derivatives, both domestically and internationally.

⁴The target countries (Terms of Reference) are: Benin, Cameroun, Côte d'Ivoire, Guinea, Liberia, Nigeria, Sierra Leone and Togo, but Ghana is included in this figure to have complete data.

Although they produce substantial amounts of palm oil, Ghana and the West Africa sub-region are not self-sufficient in meeting their requirement for oils and fats (see Table 5).

Table 5. Demand and Deficits for Palm Oil Related Products: Ghana and West Africa

Product	Ghana (Mt) (Demand)	Ghana (Mt) Supply	Ghana (Mt) Deficit (palm oil needed to meet demand)	West Africa (Mt) (Demand)	West Africa (Mt) Supply	West Africa (Mt) Deficit (palm oil needed to meet demand)
Laundry soaps	90,000	36,000	54,000	620,000	247,000	373,000
Personal wash	12,000	3,500	8,500	84,000	26,000	58,000
Fat & margarine	21,000	4,000	17,000	170,000	36,000	134,000
Edible palm oil	106,000	0	106,000	730,000	0	730,000
Total	261,000	21,000	240,000	1,934,000	134,00	1,800,000

Source: PSI Annual Report (2009), based on assumptions about trends in population growth.

Ghana exports, as well as imports, various kinds of vegetable oils, which are used for both industrial and domestic purposes. Import volumes have been generally increasing over the years compared with export volumes; groundnut oil, for instance, has seen substantial decrease in exports over the years.

Table 6: Exports and Imports of Vegetable oils (MT), Ghana (2000-2010)

Vegetable oil	2000		2001		2002		2003		2005	
	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP
Soyabean oil	50.9	1094.0		4624.5		7825.9		7240.7		2235.3
Groundnut oil	72.1	35.7		275.2		327.4	52.4	9.5	3.1	34.4
Olive oil	1.1	283.2		97.2		175.6	11.4	256.5	18.1	172.8
Palm oil (crude)	12624.6	3461.0	6696	3698.7		14677	2776.2	13599		15392.5
Palm oil (refined)	580.9	1695.0	1066	2038.8		7524	2689	12783	4311.2	12768.1
sunflower	6.0	1712.0	19.4	1629.8		1989.8		2348.3		55.7
Coconut oil	8.0	212.4		212.4		150.1	108	4.5	10.4	19.6
Palm kernel (crude)	441.0	1501.0		0.2		629.9	5.4	450	38.6	0.2
Palm kernel (refined)	0.2	0.5	41	65.7		0.002	321.3	0.6	175.3	344.5
Maize oil		38.9		38.9		86.2	0.004	4	0.1	17.1
Margarine	77.9	5101.0	713.2	4431.6		7625.1	1680.1	13254	2592.1	6519.6
Other vegetable fats	751.0	2959.0	1439	5362.4		16088	131.6	25529	4702.2	8825.9
Total	14614.0	18093.0	9975	22475.4		57099	7775.2	75478	11851.1	46385.7
Total veg. oils	15076.6	19979.0	10251	30383.2		66498	9438.3	75603	11868.4	47013.4

Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

Table 6. Exports and Imports of Vegetable oils (MT), Ghana (2000-2010) Cont.

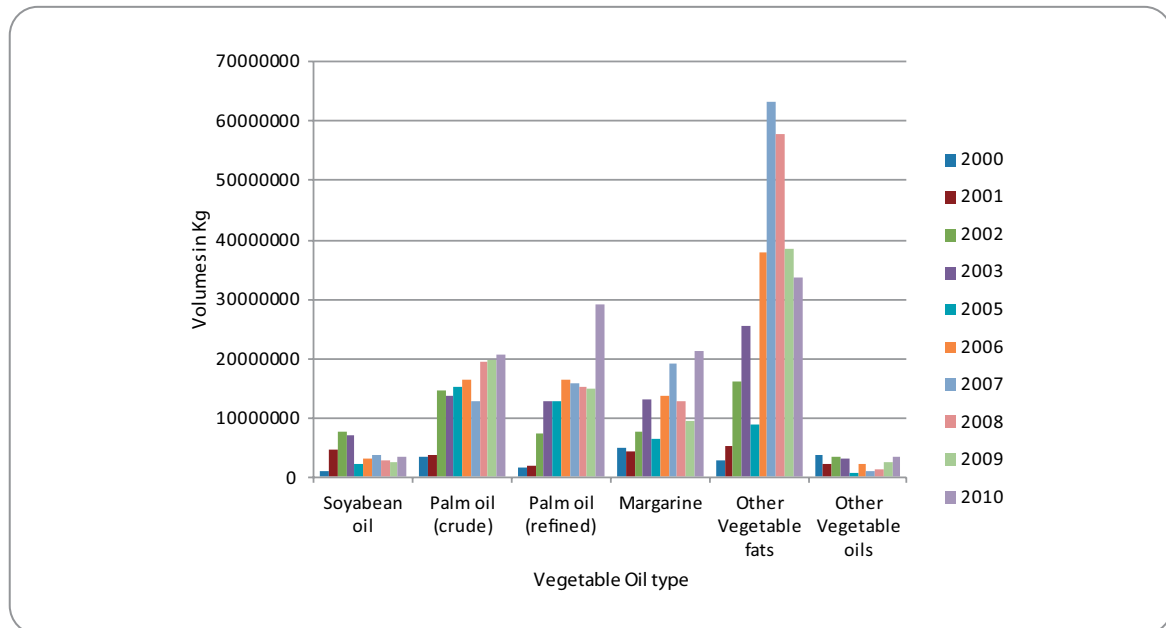
Vegetable oil	2006		2007		2008		2009		2010	
	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP
Soyabean oil		3156.4		3653.4		2759.1	0.5	2465.6		3369.5
Groundnut oil	17.8	6.5	4.8	3.1	110.4	5.4	1.4	946.4	47.7	6.6
Olive oil		295.4	4.3	409.5	1.2	419.6	8	371.9	0.2	419.2
Palm oil (crude)	823.2	16489.5	940	12962.8	398.6	19523.6	5370.1	19890.7	10723.6	20729.8
Palm oil (refined)	1105.8	16324.1	1175.5	15751.4	1619.2	15306.7	1416.7	14950	910.2	29010.6
sunflower		1302.3		72.5		96.3		84.9	20	326.3
Coconut oil	37.5	141.4	0.4	1	536.4	0.9	446.1	1.8	754.9	0.8
Palm kernel (crude)	8.7	40	243.7	40.1	23.2	110.1	2229.7	2.6	1003	1921.8
Palm kernel (refined)	18.5	344.5	140.7	494.5	517.4	641	297	1000.3	709.9	774.2
Maize oil	4.8	4	0.013	32.3		12.5		19		8.2
Margarine	0.7	13841.5	115.1	19299.6	992.6	12789.8	6402.4	9525.7	7373.6	21355.7
Other vegetable fats	373.3	37907.6	9342	63306.1	2453	57947.3	2799.6	38502.5	13526	33545
Total	2390.4	89853.3	11966.4	116026	6652	109612	18971.5	87761.3	35069	111467.4
Total veg. oils	2536.7	89948.2	13259.1	116108	7497.1	109665	19222.2	102611	35238.7	111544.1

Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

Palm oil, which has seen a steady increase in exports, has also seen a steady increase in imports at the same or even more rapid rate. From 2006 to 2010, there have been substantial imports of CPO to meet domestic industrial demand. Imports of CPO reached 20 730 MT in 2010 (see Table 6). These figures show shortfalls of CPO to meet domestic industrial needs. On the other hand, imports of refined palm oil (RPO) have exceeded exports over the period 2000-2010. Imports of crude palm kernel (CPK) have declined but there was an increase in exports of this product.

To meet the demand for cooking oil for food and for industrial use, Ghana imports different types of vegetable oils (see Figure 3). Because the supply of CPO is inadequate to meet domestic food and industrial needs, Ghana imports CPO, refined palm oil and other vegetable oils. Figure 3 shows that, between 2000 and 2010, the import volumes of CPO and refined palm oil increased, relative to the other competitive vegetable oils such as soybean oil, groundnut oil and margarine.

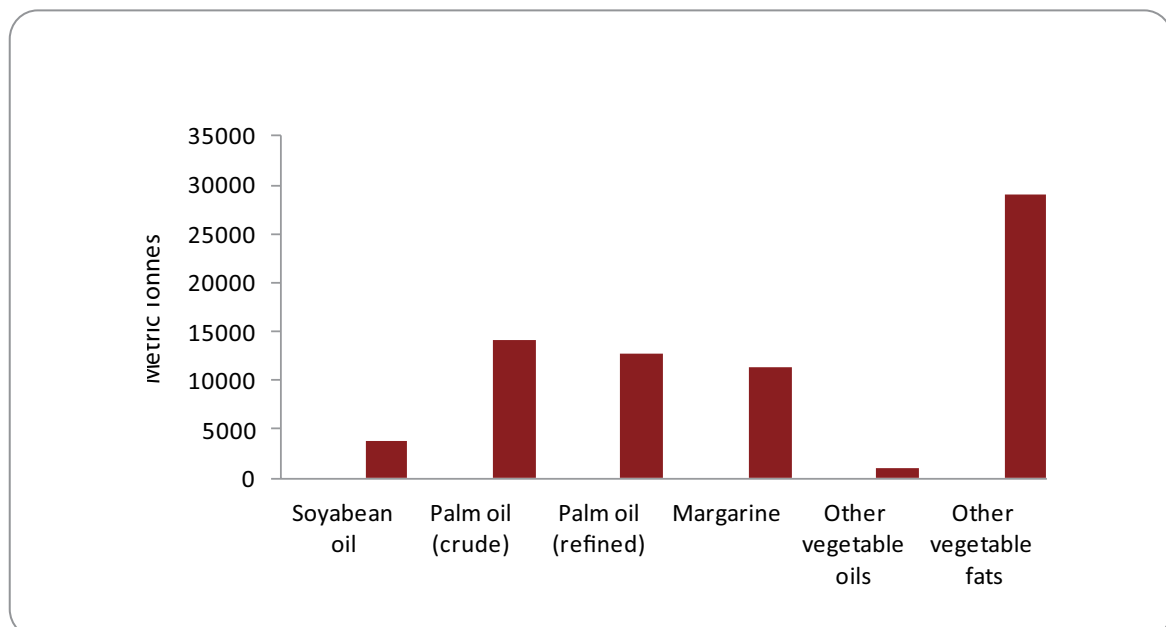
Figure 3. Volumes of Vegetable Oil Imports to Ghana, 2000-2010



Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

Figure 4 shows the prominence of specific palm oil products relative to other specific vegetable oil imports to Ghana in 2000-2010.

Figure 4. Average (2000-2010) Volumes of Vegetable Oil Imports (MT)



Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

4. Oil palm production structure, value chains and business models

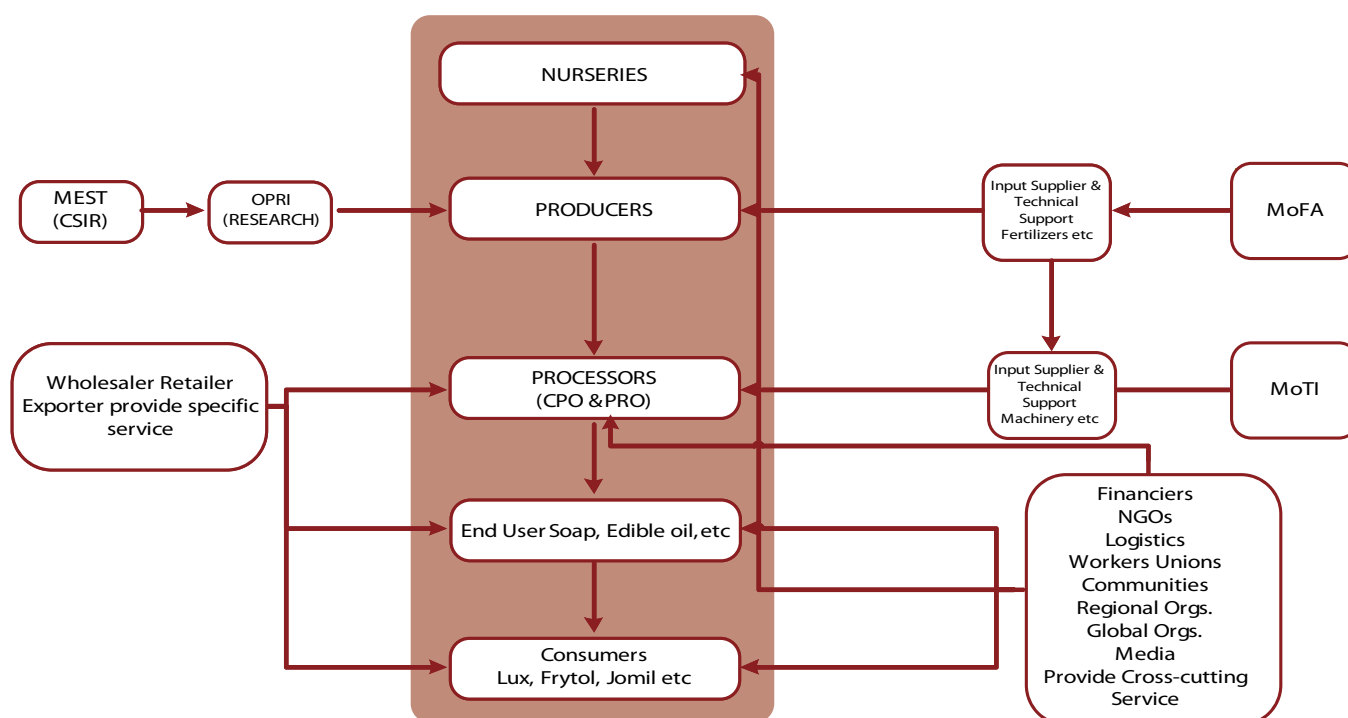
4.1 Oil palm and derivative products value chain, from plantation to final consumption/utilization

The *oil palm* supply chain consists of the following series of activities: producing raw material, linking with processing, obtaining the final product, marketing and selling to the end user. The availability and quality of support services, in the forms of transport, storage and/or finance can have an effect on costs and returns at every stage and ultimately defines the profit margins as production moves along the chain.

The main actors in the system are the producers (nurseries, smallholders, medium and large private farmers, estate plantation owners), processors, traders/wholesalers, retailers and consumers (household, commercial and industrial users). The supply chain is illustrated in Figure 5. The oil palm production system in the chain is carried out in two main production systems: (a) large estate plantations; and (b) smallholder private farms intercropped with food crops during establishment of the oil palm crop.

To a large extent, availability and affordability of inputs determine the productivity of the smallholder oil palm farms. Inputs for the oil palm supply value chain include sprouted seeds and seedlings, fertilizer, herbicides and insecticides (chemicals) and are provided mainly through the open market for the smallholder, private farmer. Inputs in the form of oil palm seeds are provided by government agencies, through the Oil Palm Research Institute (OPRI). Technical support and extension services are provided by the Ministry of Food and Agriculture (MoFA). Financing is a major link in the supply chain; this is mainly provided to the smallholder farmer through non-governmental organizations (NGOs) and micro-financing groups.

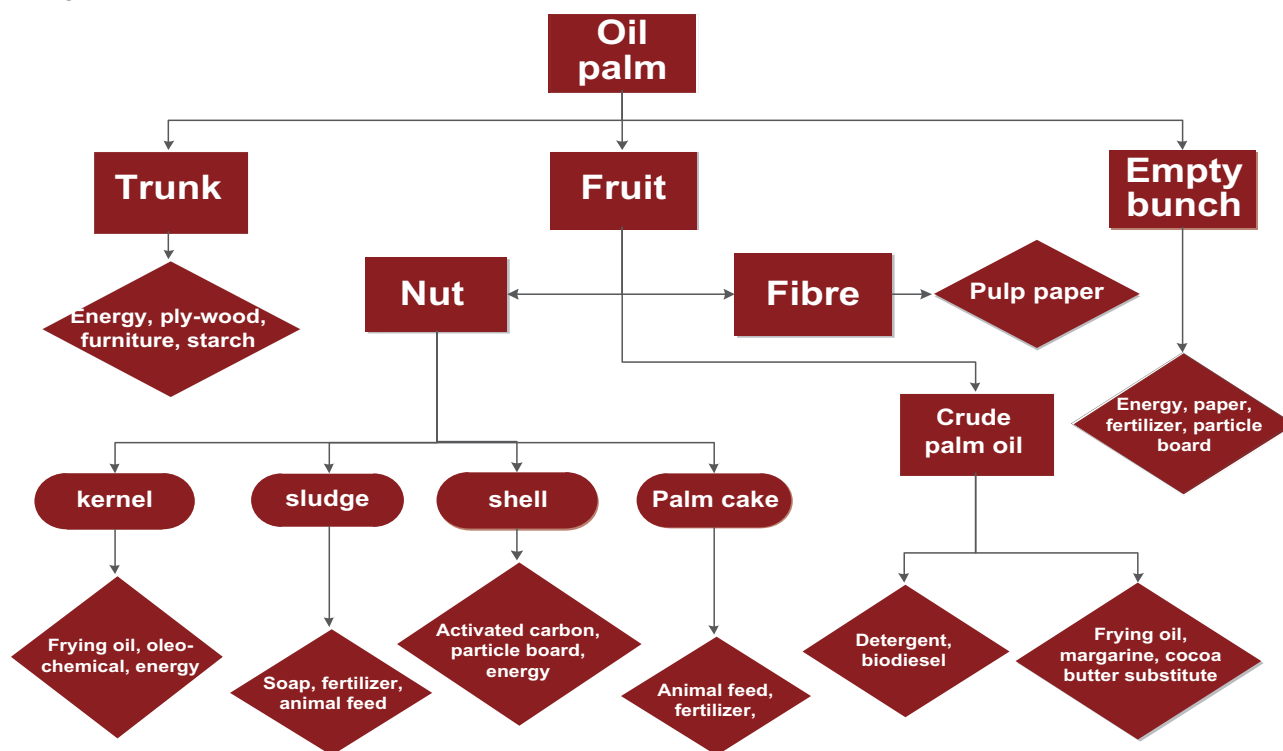
Figure 5. The Oil Palm Supply Chain



Source: MofA (2010)

The *oil palm* product value chain can be divided into three segments: value addition from the trunks, the fruits and the empty fruit bunches. The fresh fruit bunch (FFB) is perhaps the more important element in the value chain. It yields the nuts and the CPO. The CPO provides a popular cooking oil in West Africa and it can also be further processed to yield other industrial and food products (see Figure 6). The empty fruit bunches can be used as fuel, in particle board and as fertilizers in plantations.

Figure 6. The Oil Palm Product Value Chain



Source: MofA (2010)

Palm oil, palm kernel and PKO are the main products of the oil palm; however, the trees and the processing wastes generated when the fruits are processed to obtain palm oil and palm kernel also have several uses. The sludge is used in making traditional soaps and fertilizer and the palm kernel cake is used widely as an input in the feed industry and for fertilizer. In addition, the palm tree, particularly the trunk, can be used as fuel or converted to plywood, and the palm branches and leaves can be used for fibre in basket weaving and for brooms.

4.2 Prevailing Business Models and Contractual Arrangements for the Different Products and Production

In Ghana, crops produced under various forms of contract arrangements include cotton, oil palm, pineapple and, to a lesser extent, mango and citrus. In the oil palm industry, the prevailing business models currently linking smallholders in the industry in the investment strategy are: (a) the nucleus-smallholder; (b) outgrower farmers who sharecrop, rent or own their land outside the confines of the estate; and (c) independent smallholder farmers.

The nucleus-smallholder model involves smallholder farmers cropping on the land that belongs to the estate after acquisition of the land. The farmers are structurally bound by contract to a particular oil palm

estate. They are obliged to sell what they produce to a particular estate and they are often not free to choose which crop they develop, are supervised in their planting and crop management techniques, and may be organized, supervised or directly managed by the managers of the estate or scheme to which they are structurally linked. The smallholder farmers receive technical advice and inputs and are under permanent contract to sell their output to the estate.

The outgrowers cultivate oil palm outside the nucleus estate, on their own land or as tenants on a third party's land, usually adjacent to the estate farm concessions. The outgrowers receive planting material, fertilizers and other production inputs from the estate, under agreement. The contract between the estate and the outgrower farmer stipulates that the estate provides inputs on credit to the farmer (at cost), and the farmer in return supplies all his production output to the company. A percentage of the value of the supplied crop is used for loan servicing. The contract is on a share-financing basis: farmers put up a portion of the investment cost at planting time and the remaining part of the investment is a loan. Farmers enjoy a grace period on their loans, and start repayment when the trees are in full production. Outgrowers have access to very high-yielding seedlings, fertilizers, organic pest management and training in good agricultural practices. Outgrower farmers remain under the agreement until their loans are repaid, and are therefore obliged to sell their produce to the estate at an agreed price; the loan is gradually deducted from the produce sent to the estate until the loan payment is completed.

The outgrowers' dependence on the estates for inputs provided over the period under contract, among other factors, limits the farmers' decision-making control over the property and may lead to accusations of price manipulation. The outgrower contracts involve the right of the estate to take over management of the outgrower farm if the farmer fails to honour the terms of the agreement until the loan has been cleared. Because of lack of transparency in the loan deductions, farmers tend to renege on the scheme.⁵

In contrast, the independent smallholder farmers have the freedom to choose how to use their lands, which crops to plant and how to manage them. They are self-organized, self-managed and self-financed and not contractually bound to any particular estate, although they do receive support or extension services from government and private agencies, when sought. They have the freedom to crop and market their fruits on the open market and to source their inputs from the open market. They are relatively less productive, however, (using low-yielding planting materials, less fertilizer, etc.) because of the higher open-market input costs and limitations in access to other services due to their lack of access to finance.⁶

The nucleus-smallholder/outgrower model is the prevailing model in the oil palm industry and premised on the incorporation of agribusiness into traditional agrarian systems under mutually beneficial arrangements. It is seen by the nucleus/estates as a resource-providing contract to access land for production in a way that can get around land disputes and provide management specifications to ensure quality produce (growers follow recommended production methods, input regimes, and cultivation and harvesting practices). Currently, outgrowers represent the majority of the planted area easily accessed by estates.

⁵ The Estate Manager of GOPDC during the field work (9th March, 2012) indicated that their outgrower scheme has collapsed, despite it being claimed as among the most successful World Bank supported schemes. This collapse has affected the company's output negatively. The outgrower had been supplying about 60 percent of FFB and they have not been able to meet their outgrower target since the beginning of the year (2012). "We have no contract with anyone to supply us with FFB. The outgrower currently supplies 5 percent of our FFB. More than 45 percent is coming as private. But we know that those are outgrowers who come as private farmers. Total output for the whole year (2011) is 13,000 tons FFB; 40 percent of that was from the estate and the rest was supplied by others. Our target for 2011 was 140,000 tons FFB".

⁶ AduAnkrah (2008) concludes in his study that productivity and income levels of outgrowers were significantly higher than those of non-outgrowers.

Under the Corporate Village Enterprise Companies (COVE) scheme, for instance, land is acquired through landowner equity shareholding in the plantation's development companies. The plan seeks to consolidate and rehabilitate new estates from mining lands and adjacent lands vested in the COVE. This model is a resource-providing contract and the oil palm estates use contract farming to access land for production. Contract farmers are provided with inputs on credit for the establishment of the crop. The loan is recovered over a number of years as farmers sell palm fruits to the nucleus estate for processing.

Land consolidation is emphasized in this model, which tends to increase production at lowest cost on large tracts of land. It is estimated that existing low-yielding farms of about 230 000 ha will be rehabilitated and some 70 000 ha has been planted under improved seed material supplied by OPRI in the last decades. Given the production capacity of OPRI, it is estimated that it will take the next two to three decades to replace the old low-yielding farms with new stocks. This development model usually involves a large number of growers, tight central control from the estates and provision of services.

4.3 Main production structures, agro-systems and gender roles

The most suitable areas for oil palm cultivation in Ghana are in the humid agro-ecological zones in the Western, Central and Eastern Regions (see Figure 1).

The oil palm production in Ghana is organized along three main systems: (a) a nucleus-smallholder system (approximately 2 percent of all smallholders); (b) outgrower farmers (approximately 28 percent of all smallholders); and (c) independent smallholder farmers (private farmers, approximately 70 percent of all smallholders). As described above, the nucleus-smallholder system involves smallholder farmers cropping on land that belongs to the estate; the outgrowers rent or own their land outside the confines of the estate, and the independent smallholder farmers (private farmers) have the freedom to crop and market their fruits on the open market. In Ghana, the Ghana National Interpretation Working Group (GNIWG) (2011) defines the smallholder oil palm producer as: "Farmers growing oil palm, sometimes along with subsistence production of other crops, where the family provides the majority of labor and the farm provides the principal source of income and where the planted area of oil palm is usually below 40 hectares in size."

Palm oil production in Ghana consists mainly of plantation (estate) farms (currently about 25 percent of cultivated land) and private smallholder farms. The production structure of the nucleus estates links outgrower and smallholder farmers in the supply of FFBs.

Table 7. Major Oil Palm Companies and Areas Cultivated

Company	Nucleus (Ha)	Outgrower/	Unit value (USD/tonne)
GOPDC (Ghana Oil Palm Development Company Ltd.)	8,000	14,352	22,352
TOPP (Twifo Oil Palm Plantations Ltd.)	4,234	1,690	5,924
BOPP (Benso Oil Palm Plantations Ltd.)	4,666	1,650	6,316
NORPALM GH. LTD.	4,000	-	4,000
JUABIN OIL MILLS	424	1,100	1,524
AYIEM OIL MILLS	250	-	250
GOLDEN STAR (a mining company)	-	720	720
TOTAL	21,574	19,512	41,086

Source: MofA (2010)

GOPDC assists outgrowers in developing their plantations so they can sell fruits to the company. Approximately 300 ha within the concession area are cultivated by smallholders – farmers who are permitted to develop temporary plantations within the estate and sell their FFBs to GOPDC.

Table 8. Major Oil Palm Companies and Areas Cultivated (by Scale)

Company	Land Under Cultivation			
	Estate	Outgrower	Smallholder	Total
	(ha)	(ha)	(ha)	(ha)
Large Scale Mills:				
Benso Oil Palm Plantation	4,666	5,000	1,650	11,316
Twifo Oil Palm Plantation	4,500	8,000	2,800	15,300
Norpalm	4,500	8000	100	12,600
GOPDC	4,650	13,000	350	18,000
<i>Total for Larger Scale</i>	<i>18,316</i>	<i>34,000</i>	<i>4,900</i>	<i>57,216</i>
Medium Scale Mills:				
Ayiem Oil Mills	126	0	798	924
Juaben Oil Mills	424	1,100	8,636	10,160
Obooma Oil Mills	430	0	2,437	2,867
WAOPP Oil Mills	0	0	0	0
<i>Ashanti Oil Mills</i>	0	0	0	0
Adansi Oil Mills	0	0	0	0
AhwiaNkwanta Oil Mills	0	0	0	0
Anyinase Oil Mills	0	0	0	0
Others		0		0
<i>Total for Medium Scale</i>	<i>980</i>	<i>1,100</i>	<i>11,871</i>	<i>13,951</i>
Small Scale Mills:				
Small holder	232,833	0	0	233,933
<i>Total for small scale</i>	<i>232,833</i>	<i>0</i>	<i>0</i>	<i>233,933</i>
GRAND Total	252,129	35,100	16,771	305,100

Source: MofA (2010)

The large estates are currently a blend of either private/public shareholding entities or private enterprises. For example, GOPDC as a state-owned enterprise was divested in 1995, with SIAT (Ghana) Ltd (agro-processing group) acquiring a majority stake (80 percent) in the new company. Currently, GOPDC and NORPALM are inherently private while TOPP and BOPP are private/public shareholding entities.

There is a wide variation in the productivity of oil palm production in Ghana among these different farm structures. Average yields of about 1-3 MT FFB/ha are reported in the wild groves of (Dura) oil palm, 3 MT FFB/ha in the private, unorganized smallholdings, and 10 MT FFB/ha in the estates with smallholder and outgrower schemes. The large estates achieve productivity levels of between 10-15 MT/ha. In general, the highest productivity levels of 20 MT/ha have been recorded by plantations in valley bottoms.

Gender roles are clearly delineated in the oil palm sector. Studies of oil palm farmers in the Kwaebibirem district conclude that there is an imbalance between the sexes and that stakeholders in the oil palm industry would do well to encourage women to go into oil palm production in the district. However, MoFA (2010, p.7.8) indicates that in the large estates up to 60 percent of workers on the plantations were women.⁷

During the FGDs with producer groups (Damang, Kwae, Otumi), it was revealed that activities such as land preparation, carrying planting materials to field sites and transplanting, manual weeding, spraying of weedicide, pruning and harvesting are mostly done by men. Activities such as nursery management and fertilizer application are done by both men and women, while rodent control, aggregating and carrying of harvested fruits and collection of loose fruits are mostly done by women.

Decisions regarding planting, harvesting, hiring of labor and processing are mostly made by men, with women being in charge of marketing and receiving money from sales. The lands are owned mostly by men, and oil palm is commonly produced by individuals. Men usually engage in these production activities so the women can take care of the home or family. However, women may also be involved in other field activities to obtain supplementary income for the family.

The palm oil processing industry in Ghana includes large, medium and small scale processors, providing income for many rural people, especially women engaged in small-scale palm oil processing. Small scale palm oil processing is dominated by women, working either in groups or as individuals (see Table 9). The processing method is manual with improved technology processing equipment, locally manufactured.

It is estimated that the bulk of the CPO produced in Ghana is from smallholder holdings. However, the extraction rates among the smallholders are lower than the extraction rates of large estate processors, with averages of 11 percent FFB and about 20 percent, respectively.

Table 9. Number and Gender of Workers Involved in Artisanal Processing

Activities	Number of people involved	Gender usually involved
Carrying from the truck to the shed	2	Women
De-fruiting	1	Women
Removing fruits	4	Women
Loading into boiler	2	Women
Boiling	1	Women
Carrying boiled palm fruit to machine	6	Women
Pounding and squeezing	4	Men
Carrying to frying pan	1	Women
Frying of oil	1	Women
Total number of people employed	22	Women

Source: Processor interview, Nkwantanang, February 2012

⁷ The GOPDC estate has about 2 500 workers and women account for about 1 000, making up 40 percent, according to a manager during the field interview.

4.4 Production and marketing structures for small oil palm producers

A. Results from focus group discussions with smallholder producers

Producers generally operated medium (5-10 acres) to large scale (>10 acres) farms and were mostly private producers. There appeared to be some outgrowers and some private smallholder farmers at Kwae. The major agronomic differences between the private smallholder farmer and the outgrower are the types of planting materials they use and methods of weed control. Some of the private outgrowers use volunteer seedlings, while GOPDC supplied improved seedlings to their outgrowers. For weed control, the private smallholder farmers use cutlasses while some of the outgrowers use weedicides.

Improved seedlings are acquired from Kusi, where the Oil Palm Research Institute (OPRI) is located. OPRI is the only institution fully dedicated to research into oil palm. It is also the only institution that produces seed nuts in the country and is currently estimated to have the capacity to produce 5 million of palm seeds per year.

Seeds and seedlings are expensive, but farmers have access to fertilizers on the market at a subsidized rate. Almost all the agro-chemical dealers in the district are located in Kade, and thus all agro-chemical products are obtained from surrounding towns such as Kade and/or Nkwantanang. Some farmers indicated they obtain inputs from GOPDC. Nursery operations are carried out by individual oil palm producers. Men usually perform input sales and distribution roles because, according to the farmers, the men are more experienced.

Palm fruits are harvested every month; in peak seasons, as much as 30 tonnes per hectare can be harvested, while in lean seasons, only about 2.2 to 3.3 tonnes can be harvested. No type of harvesting service is provided by any government or private agency.

Women are mostly involved in palm oil processing and marketing, palm fruit marketing, and palm kernel processing and marketing. Children are seldom used as workers on the oil palm farms. The workers average age is around 20 years and percentage of household members involved in some typical oil palm activities are summarized as follows:

1. FFB production: (Male-75%; Female-25%)
2. Palm oil processing: (Male-20%; Female-80%)
3. Palm oil marketing: (Male-20%; Female-80%)

In the marketing of produce, particularly processed palm oil, women are in the majority. The domestic palm oil market is dominated by private marketers of either women groups processing to selling directly to local markets, or to private marketers for distribution within or outside the borders of the country.

It costs between GHC 137-190 per harvesting cycle to maintain the oil palm average production per acre (see Table 10).

Table 10. Cost Estimate for Maintaining an Acre of Oil Palm to Fruiting (FGD estimates)

Activity (Ghana Cedis)	Kwae	Otumi	Pramkese (1)	Damang	Pramkese (2)
<i>(Ghana Cedis)</i>					
Leasing of land	150/acre/5 yrs				
Clearing	250	30	50	50	50
Felling	100	30	100	50	30
Burning and stumping (GHC)	150	10	33	150	20
Lining and pegging (GHC)	50	40		40	25
Labor cost involved in planting (GHC)	54	60	50	30	25
Cost of seedlings (GHC)	3.50*60 seedlings (210)	4ghc*60 seedlings (240)		4ghc*60 seedlings (240)	
Cost of nets (GHC)				60	
Weeding (GHC)	60	90	100	120	75
Fertilizer application (GHC)				30	
Farm Maintenance					
Pruning (GHC)	30	60	30	50	42
Weeding (GHC)	60	90	100	120	75
Harvesting (GHC)	47	32	36	20	36
Total Farm maintenance cost/acre	137	182	166	190	143

Source: Summary by authors from focused group discussions.

Oil palm producers in the district mostly sell their FFBs to open market processors and large estate mills such as *Obooma* and GOPDC. Currently, no formal contracts exist between the estate buyers and the smallholder oil palm producers. These producers used to sell to GOPDC but, according to the farmers, GOPDC promised to transport their produce from the farms and then did not fulfil this agreement. Due to low output, GOPDC was losing revenue, so GOPDC asked the farmers to bring their FFBs to the factory; however, this arrangement was not appealing to the farmers because they had to pay the cost of transportation. Interaction between the farmers and GOPDC has weakened because producers want to be paid immediately after harvest. The only way harvesters can get their money upfront is for the farmers to sell to the local buyers. In addition, sometimes the local buyers are able to advance some money to the farmers, in anticipation of a harvest. The farmers do not have this type of arrangement with GOPDC.

The main reasons why oil palm producers would want to belong to a group would be to obtain improved seedlings, fertilizers and agro-chemicals. Currently, the nature of interactions among FFB producers, between producers and input suppliers and between producers and processors is mainly informal, through individual contacts; there are no formal contract arrangements.

Box 1. A Smallholder "Large-scale" Producer at Pramkese

In detailed discussion, one private farmer described a total oil palm farm size of 79 acres (consisting of a total of 8 different farms), all fruiting. Currently the farmer harvests a total of 31 tonnes from his 79 acres each month (average productivity of 392.4 kg/acre or 0.4 tonnes/acre per month). See Table below. The estimated cost of maintenance and harvesting/acre is GHC 170 per season.

Monthly yield of farms

Farm size (Acres)	Yield (in tonnes)
27	5
5	3
3	3
20	5
4	2
6	5
9	5
5	3
Total size: 79	Total yield: 31

Other crops cultivated by the farmer are citrus (2 acres) and cocoa (10 acres). The farmer compared the estimated revenues from oil palm, citrus and cocoa. In a good season, he makes about GHC 1,200 from his citrus farm at an estimated production cost of GHC 679/acre. For cocoa in the 2011 season, he harvested 30 bags/10 acres. The price per bag of cocoa was GHC 205 for gross revenue of GHC 6150.

For oil palm, on average, he estimates an income of GHC 23,250 (31 tonnes x GHC 150/tonne x 5 months of good harvest). He provides the cost of establishment/acre of oil palm, cocoa and citrus as follows:

Activity	Cost (Oil palm)	Cost (Citrus)	Cocoa
Land clearing	30	30	
Tree felling	15	15	
Weed control ³	30 (3 times a year)	30	
Pegging	8	8	
Digging/planting	8	8	
Cost of chemical for spraying			10
Labor cost for spraying			30
Pruning	60		
Harvesting	20/tonne		48
Transport			60
Cost of seedling	110 (110 seedlings)	150 (60 seedlings)	24 (120 seedlings, each costing 0.2)
Land leasing/5 years	500	500	

Box 1. A Smallholder "Large-scale" Producer at Pramkese (Cont.)

The private farmer is quick to conclude that oilpalm production is currently very profitable relative to citrus and cocoa. The farmer has a household size of 6 and provides household labor use on his oil palm production as:

Production activities	Number of males/females involved in production activities			
	No. of males	No. of females	Total males in household	Total females in household
Fresh fruit bunch production	4	2	4	2
Palm oil processing	0	1		
Harvesting services	4	0		
Fresh fruit bunch marketing	4	0		
Palm oil marketing		1		

Source: authors interviews

B. Results from focus group discussions with smallholder processors

Detailed discussions on production and marketing were held with two processor groups at Damang and Nkwantanang. Given the similarities in their responses, only the Nkwantanang FGD will be discussed here. Members of the Nkwantanang FGD belong to a group called the Mmoa Kuo Processing Group, which was formed in 2004 with a total membership of 35 (10 male, 25 female). They describe their scale of processing as small to medium, with commercial orientation, and they sell in the local market and to traders who then sell in markets in Accra, Togo and Nigeria. The group's main products, in order of importance, are *Zoomi* (a specially prepared palm oil for cooking), palm oil for cooking and oil for soap.

The group sources their raw materials from the open market. Sometimes members who are also smallholder farmers, sell their produce to the group for processing. The group's processing extractor and mill equipment are ten and five years old, respectively, and their digesters and extractors are nine and four years old, respectively. They classify their method of processing as mechanical, and the technology as advanced. They acquired the engine for their machine from Accra, and when it breaks down local artisans are able to manufacture some of the machine parts for them.

Product (palm oil) quality is determined mostly by visual inspection. The group members use clean for cooking the palm fruits. Output quality is determined by observing the red colour during inspection. Overall, however, they classify the quality of their product as "medium". The group members readily admit that they need training to address their output quality and also on how to maintain sanitation quality.

Group members are optimistic about expanding in the future. They see the need for expansion in order to produce PKO and other products and therefore they intend to install seed crushers. Among the reasons to expand processing activities: (a) a high demand from exporters; and (b) increased income from processing. They plan also to expand and upgrade their processing by buying an improved processing machine that can digest and extract at the same time. Such a machine currently costs GHC 5 000 and they have not yet mobilized the required funds; they are appealing for external assistance in this regard.

There are divisions of labor by gender in the processing chain of activities. Men perform mostly stripping of fruit, extraction and digestion. Women undertake boiling the fruit, putting the boiled fruit into the machine and carrying firewood for processing.

The group faces multiple challenges in processing, which include the following:

- (a) Frequent mechanical breakdowns occur as a result of inferior materials. The thread (a component of the extractor) often gives out because the metal used in the manufacture is not strong enough to withstand long periods of use. The appropriate metal is quite expensive and when processors give artisans money to buy it, they are not sure if the genuine metal is used by the artisans.
- (b) The competition level is high. There are many processors around so the farmers are able to sell the palm fruits at high prices. This increases processing costs.
- (c) Land for cultivation of oil palm is gradually becoming quite scarce. This will have an impact on potential volumes of fruits that can be supplied.

Table 11 summarizes the estimated oil palm processing costs and revenue per tonne FFB/week, as described in the FGDs. In general, it appears that the larger the volume of FFB processed per week, the higher the margin on processing, conferring economies of scale to the processors.

Anticipating future challenges to small scale processing, the group members indicated that their business is at risk of collapsing because the large scale mills, which benefit from economies of scale and can process efficiently, are able to offer lucrative prices to farmers for their fruits. For instance, the larger mills offer farmers GHC 195/tonne of fruits (covering both sale and transport) whereas the medium sized mills don't pay the transportation costs for the farmers. Another challenge is that prices of palm oil are not stable. Buyers of palm oil from the group set the prices and the major reason they give for offering low prices is that "the market is not good". The large mills are able to process fresh fruits and therefore produce better quality palm oil. For all these reasons, the small mills see the larger ones as a threat to their survival. The group has appealed to the government both to help them acquire more machines and to help them market their outputs.

Table 11. Oil Palm Processing Cost and Revenue

Cost/revenue items	Kwae	Nkwantanang	Pramkese
Cost of one tonne of fresh fruits GHC	160	150	140
Total tonnes of fresh fruit processed per week in 2011	1	10	30
Cost of processing per tonne of fresh fruit GHC/week	Total =56/tonne	GHC 50/tonne	40
Labor			
Water		GHC 20/tonne	1.67/tonne (Total electricity bill is GHC 200/month. Total processing per month is 120 tonnes). Firewood GHC 20/tonne
Energy (electricity/firewood) GHC			
Total cost (cost of fresh fruits + processing cost + transportation cost/week)	160 + 56 (216)	(150*10)+(50*10)+ (20*10) = 2200	(140*30) +(40*30) + (1.67*30) +(20*30)= 6,050.1
Total cost/tonne/week (GHC)	216	220	202
Volume of oil extracted per tonne FFB	150 litres	150 litres	150 litres
Price per drum of 225 litres (GHC)	280	360	280
Price per litre of extracted palm oil, 2011 (GHC/litre)	1.24	1.60	1.25
Revenue (price/litre of palm oil x extraction rate of FFB/tonne x total tonnes processed) per week	1.24* 150* 1 186	1.60*150*10 2400	1.25*150*30 6750
Revenue/tonne/week (GHC)	186	240	225
Margin / tonne of fresh fruit processed per week	186-216 = -30	240-220 = 20	225-202 = 23

Source: Authors' calculations from surveys

Box 2. Joe's Palm Oil Mill and Farms - a "Medium-scale" Private Processor

Joe's Palm Oil Mill and Farms is a privately managed oil palm processing company located in Pramkese. The main product produced is oil palm and currently the company does not use the palm kernel. The farm is aware of the immense profits that could be derived from adding value to the palm kernel. The farm uses improved technology in palm oil processing and the company is currently involved in planting a 300-acre farm of oil palm, to be finished within three years. The farm seeks to expand current output by more than three times, as demand for palm oil is very high. At present, the farm operates a 100-acre farm and also supplements by buying from other farms. The processing machine's current rate of extraction is 50-55 percent (processing equipment is about 2.5 years old) which is inefficient. Using this machine, oil is extracted three times for every FFB. The second extraction yields about 20 percent of the first one; while the third extraction yields about 10 percent of the first one. Currently, there is a locally-made implement which combines pounding and squeezing which can improve efficiency to between 75 to 90 percent. It would currently cost around GHC 7 000 to install this machine.

Box 2. Joe's Palm Oil Mill and Farms - a "Medium-scale" Private Processor (Cont.)

The quality of the palm oil is determined by visual assessment, taste and smell. The farm sells the majority of its product to traders who take it to Nigeria and Togo. The product is also exported to Italy, where it is used as a biofuel. Due to the varying qualities demanded in the local markets, marketing locally is quite difficult since the oil produced locally is of low quality for food. There is no formal contract between the producer and the buyers. Access to credit is a limiting factor to progress of the business, as are the hurdles of bureaucracy in governmental agencies that frustrate assistance to farmers.

By-products are handled by burning and use as manure or fertilizer on the farm. The company sees demand increasing for the product more rapidly than supply. In response to this increasing demand, expansion plans include: (a) the 159 hectares of oil palm farm, out of which 100 acres has started fruiting; (b) expansion of the business, when there is more FFB supply, by using more efficient machines; (c) a goal of increasing the production per week to 60 drums (from a current 20 drums); and (d) acquisition of a tractor to aid in transporting fruits from the farm to the mill.

Source: Authors' surveys

C. Household production and market structures: in-depth interviews with smallholder palm oil marketers

There are several individual traders in palm oil, marketing within the country and outside, particularly to Togo and Nigeria.

The field study conducted an in-depth interview with a woman private palm oil marketer located in Pramkese who markets within the country. This marketer has an educational level of primary class 5. She has a household size of 10 (6 women and 4 men) and 3 of the 6 women, as well as her husband, sometimes help her. She belongs to a group of about 22 women who buy palm oil from Pramkese to sell in Accra and Tema. To ensure that every one of them gets goods to sell, they have divided themselves into two groups; one group sells for a month and the other group sells for the next month. The marketer interviewed takes an average of 8 pig feet containers (1 pig feet container = 56.25 litres) of palm oil to Tema per trip; on average, each of the women in the marketing group takes between 5-10 pig feet containers per trip.

She buys the 56.25 litre of oil for GHC 85 (GHC 1.5/litre). For a total cost of GHC 8.5 spent on transport and offloading, she sells the contents of each container for between GHC 100-110. She determines the quality of the produce by being present during the processing to ensure that fresh fruits are used. When she has not been physically present, she uses her sense of taste to determine quality: she stirs the oil and tastes; if it "settles" on the tongue it's not high quality oil.

The field study also held an in-depth interview with an individual private palm oil marketer located in Damang who sells her oil in Togo and Nigeria. She is 52 years old with no formal education and has been in the oil palm marketing business for the past 15 years. She has a household size of 10 (6 women and 4 men) and 1 of the 6 women is involved in palm oil marketing. She does not belong to any group. She takes an average of 110 yellow gallons (2475 litres; 22.5 litres = 1 yellow gallon) of palm oil to Togo every week. She buys the 22.5 litre container of palm oil for GHC 27 (GHC 1.2/litre) and spends a total of GHC 3 on transport and offloading, for a total cost of GHC 30. She sells the contents of the container at her destination for between CFA 11 000-12 000 under differed payments (F CFA10 000 = GHC36.55). There is a very high demand for quality oil in Togo and Nigeria.

D. Results from in-depth interviews with large-scale processors

The GOPDC at Kwae and the WAML Industries Limited at Nkwantanang are large-scale processors of oil palm and PKO, respectively. Interviews were carried out with the company managers and touched on the industry outlook and the role of smallholder farmers in the industry.

(a) GOPDC

The capacity of the processing mill is 60 MT/hour but, due to a lack of fruit supply, the mill is unable to utilize 60 percent of its capacity. Processed fruits in 2010 amounted to 36 000 MT, but dropped to 29 000 MT in 2011 for various reasons, including less FFB supply because of low crop yield and small processing plants buying fresh fruits from farmers. About 5 MT of fruits are required to produce 1 MT of CPO, a conversion rate of about 20 percent. Most CPO contains high levels of free fatty acid (FFA) so it not very healthy to consume. The GOPDC estate processes fresh fruits so they contain less FFA. The CPO produced by the estate contains 4 percent FFA. GOPDC products include:

- 1) CPO, used mainly for making soap and currently being exported to Europe where it is being used as a substitute for cocoa butter;
- 2) Palm Kernel Cake, mainly sold as animal feed;
- 3) Refined Bleached Deodorized Oil (RBDO), used in making cream and biscuits, mainly sold to Senegal where it used for industrial purposes;
- 4) Refined PKO;
- 5) Palm Fatty Acid Distillate (PFAD), mainly used in making detergent;
- 6) Palm Olein, sold as cooking oil;
- 7) Stearin, used in making bakery products, margarines, quality soaps, "Maggi cubes", biscuits, milk and ice cream.

GOPDC currently employs about 2 500 workers. Women account for about 1 000 of these. About 90 percent of its refined oil is sold locally, with no branding and mostly sold in bulk. Some products are sold to Nestle Ivory Coast and Senegal. Plans are underway to do business with Nestle Ghana. FFBs are acquired from the plantation and supplemented by buying from local farmers, although GOPDC is subject to competition with local processors.

With respect to the environment, GOPDC has a 30 MT/hour boiler with a 2.5 MW turbine, producing 30 tonnes of superheated steam per hour, which runs a steam turbine to generate enough electricity to serve the mill, a refinery/fractionation plant and the estate 24 hours a day, 7 days a week. The huge amounts of organic waste produced (empty fruit bunches, fibres and nut shells) are burned as fuel in the boiler. The Environmental Protection Agency (EPA) usually comes to the estate quarterly to check for sound, air and water pollution. Equipment at GOPDC is able to filter to get good CO₂.

The company makes a point of using current technology in its activities. It has taken delivery of a bio-mechanization plant which is to be installed and operational by end of 2012. This plant will address effluent problems. The company also recently acquired equipment called the Bobcat, which performs multiple operations, such as pushing and lifting of the produce. Future plans are to increase the acreage under cultivation and have a processing target of 150 000 MT per year. The company has adequate workers to be able to achieve these goals and is prepared to meet local demand (industrial and food); it believes the government should reduce imports of CPO.

(b) WAML Industries Limited

WAML Industries Limited is a Free Zone Enterprise, begun in 2002 as a result of a survey which showed that 65 percent of oil palm processing was handled by local processors, and therefore demonstrated a need to take care of the nuts they produce which had very high demand in Nigeria. The company produces PKO. Two kinds of oil products are produced: premium, which has less than 5 percent FFA, and regular, which has more than 5 percent FFA.

The capacity of current equipment at Nkwantanang is 18 tonnes per day at a 38 percent recovery rate (although during three months of continuous test monitoring of the machines, a 44 percent recovery rate was achieved). The company employs 9 permanent staff and 15 casual workers. The raw material supply base (palm kernel) is regular and locally sourced, even though the company has to compete with buyers from Nigeria and other West African countries for this raw material. A strategy adopted by individual Nigerian buyers is to increase their prices for palm kernel.

WAML purchases their raw material by setting prices around 24 percent of world market price for the final product. Sixty kg of fresh nuts costs GHC 25-26. If they are kept for a longer period of time they reduce in weight to about 51 kg and the quality of the oil is not as good (the oil is mostly rancid). The company currently does not have any problem with raw material supplies. It has 1 500 agents (aggregators) who buy on commission; last year, they bought 5 000 bags of nuts within one month from Pramkese, Okumaning and Takorasi.

Being a Free Zone Enterprise, part of the company's obligation is to sell 30 percent of its product locally. As part of this arrangement it sells PKO to GOPDC and other local agents across the country. Premium oil is sold to GOPDC. This is mainly purchased during the low production season. Because the FFA in premium is relatively low (5 percent or less), it commands higher prices. Regular oil constitutes about 70 percent of the PKO produced by WAML. The main market for regular (5-7 percent FFA) is in Nigeria, with ROM and Gulf Impex in Nigeria, as major customers. This is because the Nigerian market price is always higher than the world market price by 20 percent. There are also unaffiliated individuals who purchase PKO from WAML to supply the local market, although such purchases are not very regular. Some of these purchases are sent to areas such as Kasoa (Central Region) and Obuasi (Ashanti Region). The quality of the PKO is determined by GOPDC. Palm kernel cake is also produced locally for the poultry industry. A 50 kg bag costs GHC 60. The palm kernel shells are exported to Norway and Germany. The company operates an integrated system, from cracking nuts to processing, and normally generates a 15 percent net profit margin.

Table 12 summarizes the profitability status of the company. Estimated gross margin per MT of processed palm kernel is GHC 60.87. Similarly, based on the estimated RCR of 1.56, large scale palm kernel processing appears profitable.

Table 12. Summary of Profitability Analysis of WAML Industries Limited

COST ITEM	Oil Extraction Rate (OER)	COST/ MT(GHC)	Total Costs (GHC)	Extracted Products (MT)	Local Sales Price (GHC/MT)	REVENUE (GHC)	World Market Price (NOV 2011) USD
Cost of one MT of palm kernel GHC		90	81,000				
Cost of processing one MT of palm kernel GHC							
Labor (per tonne of 900 MT)		4.96	4,464				
Staff cost (per tonne of 900 MT)		8.3	7500				
Utility		3.9	3500				
Fuel operations (per tonne of 900 MT)		1.33	1200				
Other cost (per tonne of 900 MT)		0.67	600				
Total cost of processing 900 MT per month			98,264.00				
Cost/MT			109.2**				
PKO	38%			85.5	1,640(\$1,050)	140,220	\$1,170/MT
CRR- Cake	50%			101.25	60	6,075	
Nut recovery rate (NRR)—Nuts	25%						
Shell recovery rate (SRR)—Shells	50%			450	15	6,750	
Total revenue (revenue from processing 900 MT per month)						153,045	
Revenue/MT						170.1	
Gross Margin / Month						54,781.00	
Gross Margin / MT						60.87	

Source: Courtesy of Factories Manager, WAML Industries Ltd.(1USD = 1.55) Estimated Revenue-Cost Ratio (RCR) = 1.56 ** USD 70.5.

WAML relies entirely on electricity from Electricity Company of Ghana for its operations. The company monitors energy consumption by taking meter readings before and after production. To keep abreast with technology, and also to be energy efficient, the company is acquiring a 10 MT/hour plant which comes with its own turbine and has the capacity to generate energy for the factory. Environmentally, the company's major problem is sludge. However, WAML is close to obtaining an EPA certification that solves this problem.

E. Results of field survey of smallholder producers

In Tables 13 and 14, about 64 percent of the respondents indicated they are small scale (<5 acres) producers, while 34 percent described themselves as medium scale (5-10 acres). Females constitute 32 percent and 22 percent of the small and medium-scale producers, respectively. Overall, female smallholder farmers constitute 28 percent of total producers.

Table 13. Gender and Scale of Production

Gender of respondent	Scale of production			Total
	Small-scale producers	Medium-scale producers	Large-scale producers	
Male	23	14	1	38 (72%)
Female	11	4	0	15 (28%)
Total	34 (64%)	18 (34%)	1 (2%)	53 (100%)

Source: Authors' own surveys

Table 14. Gender and Acreage under Oil Palm Cultivation

Scale (acreage)	2009		2010		2011		Total (2011)
	Male	Female	Male	Female	Male	Female	
Small (<5)	2	1	0	1	7 (58%)	5 (42%)	12 (100%)
Medium (5-10)	5	0	5	0	13 (72%)	5 (28%)	18 (100%)
Large (>10)	1	0	3	0	13 (76%)	4 (24%)	17 (100%)
Total					33 (58%)	14 (42%)	57 (100%)

Source: Authors' own surveys

Table 14 shows that, while the proportion of women with small acreages (42 percent) compares favourably with that of men (58 percent), a higher proportion of men than women have medium to large acreages (72-76 percent compared with 24-28 percent).

Table 15. Gender and Type of Production

Gender of respondent	Type of production		Total	Percentage of Private holders by Gender
	Private	Outgrower		
Male	37	1	38	69.8
Female	14	1	15	26.4
Total	51	2	53	96.2

Source: Authors' own surveys

Table 16. Gender and Smallholder Farmer Linkages with Buyers of FFBs

Gender of respondent	Linkage with buyers of fresh fruit bunches			Total
	Formally, through representative of buyers associations	Through personal linkages	No links with buyers	
Male	5	15	20	40
Female	3	2	7	12
Total	8 (15%)	17 (33%)	27 (52%)	52 (100%)

Source: Authors' own surveys

Almost all the respondents (96 percent) are private smallholder farmers, which may be a sign of the recent decline of the outgrower system in the district (Table 15). Most of the smallholder farmers (85 percent) are not linked formally (for example, through the outgrower system) to buyer entities (see Table 16). All the respondent farmers interviewed indicated they do not receive any form of extension, pruning, harvesting or credit services from GOPDC. Smallholder farmers have their own personal linkages with buyers (33 percent) or sell directly on the open market (52 percent).

Table 17. Gender and Quantity Harvested per Acre (2.5 acres = 1 ha)

Quantity (MT) harvested per acre (<i>productivity</i>)	2009		2010		2011		Total (2011)
	Male	Female	Male	Female	Male	Female	
< 1	1	1	1	1	1 (50%)	1 (50%)	2 (100%)
1-5	7	0	8	0	16 (84%)	3 (16%)	19 (100%)
5.5-10	5	0	2	0	8 (62%)	5 (38%)	13 (100%)
> 10	1	1	1	1	10 (77%)	3 (77%)	13 (100%)
Total					33 (58%)	14 (42%)	57 (100%)

Source: Authors' own surveys

Productivity levels (quantity harvested per acre) of the respondent smallholder (selling to plantations) oil palm producers are low, compared to the estimated 7-10 tonnes/ha produced by smallholder outgrowers and about 3 tonnes/ha by private small-scale producers (selling to open market). The estimated productivity of the majority of the respondents is about 5 MT/acre (2 MT/ha) (see Table 17).

5. Public and private role in oil palm industry in Ghana

5.1 Past government policies in the oil palm industry

Ghana's international trade in oil palm started from wild palm harvesting in 1820; oil palm evolved into an agricultural crop, and plantations were established by 1850. Plantations did not have a significant impact on volumes of palm oil, which continued to be based primarily on private small-scale peasant production in the oil palm belt. Palm oil, however, became the principal export from what was then called the Gold Coast. It is estimated that by the 1880s, palm oil accounted for 75 percent of export revenue.

Post-independence, state-owned and state-operated plantations were favoured through policy directives involving greater emphasis on oil palm and rubber. After Ghana became independent, large scale state farms, were established and an Agricultural Development Corporation (ADC) was set up to promote agricultural modernization and development through the state farms. One goal was diversification away from cocoa and timber to include oil palm and other tree crops. Under the Second Five-Year Development Plan (1959-1964), the ADC's role expanded (Khor and Hormeku, 2006). Emphasis was placed upon import- substituting industrialization, mechanized agriculture and direct public intervention in production. Small scale independent farmers were organized to pursue mechanized agriculture through cooperative efforts.

However, as a result of capital constraints, political interference, poor planning, mismanagement and the rigidity of the centralized control system, these state-owned farms became economically unviable. State

farms were therefore gradually phased out as the economy became increasingly privatized. Attempts were made to reorganize the remaining plantations into viable economic units under decentralized state control.

GOPDC was initiated by the Government of Ghana (GoG) in 1975 in the Kwaebibirem District in the Eastern region as an alternative crop to cocoa and timber. BOPP was established in 1976 as a joint venture between GoG and Unilever at Benso in the Western Region. TOPP was incorporated as a limited liability company in 1977 by GoG, government institutions and foreign investors.

Since the trade liberalization policy that started in the early 1980s, the GoG privatized the state-owned plantations and mills, including divestiture of GOPDC in 1995. The government, with the assistance of multilateral donor institutions, has sought to promote oil palm plantations through private enterprise, foreign-aided government ventures, and joint government-private projects, such as:

- (a) GOPDC, privatized in 1995 and wholly owned by SIAT since 2008;
- (b) TOPP, with GoG as the major shareholder (80%) but managed by Unilever;
- (c) BOPP, which is currently owned by Singapore-based Wilmar International; and
- (d) NORPALM, formerly the National Oil Palm Limited.

The sector-specific policy for the tree crop sector including oil palm under the Food and Agriculture Sector Development Plan (FASDEP) has been to promote oil palm production based on comparative and competitive advantages of agro-ecological zones and the availability of markets and to commercialize through linkages to industry. Research is to be pursued to identify genetic material with desired qualities and to improve productivity along the oil palm value chain. Emphasis is placed on the following: cultivation of improved hybrid variety; expansion of the nucleus outgrower scheme with an aim to increase production through area expansion and intensification of cultivation; and the upgrading of artisanal processing.

As already indicated, diversification away from cocoa and timber to include oil palm and other tree crops has been a focus since 1975. In October 2002, the GoG under its President's Special Initiative (PSI), focused on oil palm as one of the key strategic pillars of agricultural and industrial-led growth and poverty reduction because of its potential to become the next biggest export commodity after cocoa. Given the estimated 100 000 MT shortfall in domestic production to meet domestic demand (food and industry), as well as the need to take advantage of the huge export potential within the sub-region, the objective of the PSI has been to increase the country's oil palm production to meet domestic demand and satisfy regional exports (PSI, 2002). The main thrust of the PSI is to help OPRI produce improved planting materials to develop nurseries for expanded acreage production mainly by the private sector.

The initiative set an ambitious target of bringing an additional 10 000 ha under oil palm production by 2003, raising that to 100 000 ha by 2007 and further raising it to 300 000 ha in the long term under the nucleus-outgrower-smallholder estate development model. The PSI so far has achieved some successes including:

- (a) establishment of nurseries – 12 nurseries are currently operational, established through private operators in the Western, Eastern, Ashanti, Central and Brong Ahafo regions;
- (b) production of high-yielding and quality seedlings – a total of 2.84 million seedlings, worth about GHC 4 269 994, were produced from 2004 to 2006;
- (c) establishment of plantations – under the PSI, 19 237 ha was planted from 2004 to 2006 ; and
- (d) farmer mobilization and support – a total of about 11 000 farmers have been supported.

However, at this time, the PSI oil palm project is in turmoil. What began as a well-funded plan to launch Ghana into a new era of stunning growth in the oil palm sector has been stagnating and deteriorating for the past three years in the almost total absence of funding. Most farmers are disappointed and angry, as they have been left to their own measures in maintaining their palms, contrary to what they were promised. They

had been promised a great deal of support and they originally had great confidence that their palms would mature properly and yield in abundance. These smallholder farmers feel it is unreasonable for them to be required to pay back the value of the palms when they have been unable to look after them or fertilize them throughout their short lives. In addition, it will be much harder for the farmers to repay the amount owed to PSI for their palms when the yields will be much lower than anticipated.

In conclusion, the PSI programme was a successful, well-conceived project in its early years. There were problems along the way, but a number of good quality hybrid Tenera oil palm seedlings were planted, to the long-term benefit of the individual farmers, the economy and the nation. There are now 22 active nurseries compared to the original 12, with another 11 in various stages of development. Given that the number of nurseries has more than doubled, the budget demand will increase proportionally. However, the status of PSI funding support has changed dramatically. Curiously, it seems that a huge capital investment was made in setting up the new batch of nurseries just prior to the complete collapse of operational funding. It appears somewhat inadvisable to make this level of capital investment without firm arrangement for an operational budget over the following five years or more.

The question now is what to do next? Is the continued operation and development of the PSI oil palm project something the GoG is passionate and confident about? Is it something the government has both the will and the means to properly fund on an ongoing and open-ended basis? Or has the project already served its purpose sufficiently to seek an honourable withdrawal? The stated long-term target was to plant 300 000 ha across the palm growing areas of Ghana, but does this have to be done by the government?

The initial planning called for establishing Corporate Village Enterprise Companies (COVES), each consisting of landowners, farmers, and a milling company. The basic idea was to secure land for a nucleus estate of 5 000 ha, then boost fruit supply with smallholders' schemes and purchasing from outgrowers. Central to each COVE was a 20 TPH [tonne per hour] palm oil mill. A number of these COVES were planned around the country. However, for whatever reason, none of these materialized. What has evolved is the installation of a large number of independent nursery companies that supply seedlings to farmers in their localities but that are sited in a widely spaced manner in order to cover as much of the region as possible. The only areas where significant clusters have formed are around Kade, and north of Takoradi in the Western Region, and in both instances there are plenty of large commercial mills already operating there.

Unavailability of high-yielding planting material, poor agronomic practices, and cultivation by smallholdings still characterize the oil palm industry and these are the main constraints to oil palm production. These constraints have been the focus of policy interventions, including the medium-term objective of enhancing smallholders' access to credit, improved planting material, extension on improved agronomic practices and capacity to expand farm size, through vigorous promotion of the established outgrower-nucleus farmer linkages. Recently, the government's policy on fertilizer subsidies has been a major intervention for increasing productivity on oil palm farms. Other recent major government interventions in the oil palm industry include:

- (a) the Buabin Oil Palm Outgrowers Project (BOPOP), covering an area of 3 000 ha for 500 outgrowers;
- (b) the Ghana Sumatra company that specialises in palm oil seeds increased palm oil seed production capacity of OPRI from 2 million to 5 million seed nuts per year under the World Bank-sponsored Agriculture Services Sub-Sector Investment Programme (AgSSIP); and
- (c) the development of a master plan for the oil palm sector under Agence Française de Développement (AFD) with government-secured funds, including development of policy, strategy and implementation manuals for tree crops.

BOPOP was started by MoFA in 2007 as a five-year project. The objective of the project was to develop 3 000 ha of new plantation, based on an outgrower scheme for 500 growers. The project covers two areas, Buabin and Jukwa, in the Central Region of Ghana, with TOPP as the technical operator. The planting of oil palm in the Buabin and Jukwa project areas started in 2007 and 2010, respectively. So far, BOPOP has developed 3 297 ha and the farmers developed 547 ha. The Council for Scientific and Industrial Research (CSIR) and OPRI provide consulting services for the implementation of the applied research component of BOPOP. The GoG is contributing euros 2.12 million while international financiers AFD and KfW (German development bank) are together contributing euros 13.41 million to the fund. A total of euros 4.12 million is allocated to the oil palm plantation project. Other components of the project include loans to farmers and construction of project sites. A tripartite agreement has been signed between the farmers, the banks and the technical operator.

5.2 National plans for development of the oil palm industry: Evaluation of public and private investments

Supporting the key role of the smallholders requires concerted government and private business coordination. The current national plan for development of the oil palm industry is premised on the private sector-led initiative facilitated by the government through outgrower schemes. The main strategy is to link outgrower schemes through technical operators such as TOPP and BOPOP.

A new large scale development plan for Ghana's oil palm industry, the Oil Palm Master Plan, is being prepared to raise the nation's competitiveness in oil palm production. It is expected to boost the industry's competitiveness in the global commodities market and also enable it to meet the rising local demand for consumption and manufacturing.

The Plan focuses on access to finance, certification, land-use policy, technology transfer, and infrastructure development from the farm to the port, as well as pricing mechanisms and marketing. The policy document seeks to outline a set of projects and programmes to be executed within the next 15 years and it will become the blueprint for the sector's growth. This Plan aims at maximizing development outcomes for communities while supporting smaller businesses as well as alleviating poverty. There is a need to assess the role of the smallholder farmer in the Master Plan.

With respect to the trade regime governing palm oil imports, Ghana is among the countries that have fully implemented the free-trade area component of the Economic Community of West Africa States (ECOWAS) Trade Liberalization Scheme, which started in 1997. Like other ECOWAS countries, Ghana does not impose any tariffs on eligible imports originating in other ECOWAS countries. Imports from other ECOWAS members are duty-free.

The ECOWAS Common External Tariff (CET) is one of the instruments for harmonizing member states and strengthening the common market. The ECOWAS-CET draws on the basic West African Economic and Monetary Union (UEMOA) CET; it is composed of four tariff bands, or rates of customs duty with the rest of the world: zero, 5 percent, 10 percent, and 20 percent. At a summit meeting, the heads of state adopted a Supplementary Act to create a fifth band of the ECOWAS CET at 35 percent, for "specific goods for economic development" as well as adopting common eligibility criteria for this band among all the ECOWAS member states. The eligibility criteria include product vulnerability, economic diversification, integration, sector promotion and high potential of production.

Ghana's applied tariff consists of the four original tariff bands; this structure applies to all goods except for 13 petroleum products, which face specific tariffs. Oil seeds, fats, oils and their products (including CPO) have a tariff range of 10-20 percent. Most Favoured Nation (MFN) rates on agricultural products, as defined by the World Trade Organization (WTO), are generally higher, averaging 17.5 percent, with the highest rates applicable to dairy products and tobacco.

Nigeria, however, has a 35 percent tariff on CPO, having invoking the fifth band as a protection measure for their oil palm industry, under the "infant industry" argument. Recently, there has been pressure on Nigeria from the industry players to reduce this tariff rate.

The Common Effective Preferential Tariff (CEPT) scheme for the Association of Southeast Asian Nations (ASEAN), however, has fallen between zero and 5 percent for all products. On exports, specifically for palm oil, Indonesia has lowered its maximum export tax on RBDO to 10 percent to boost exports, while the rate for CPO remains at 22.5 percent. Indonesia is a major palm oil exporter. With a lowering of that country's export tariffs on refined palm oil, it is likely that a lowering of tariffs in the West Africa sub-region could promote an influx of imported palm oil, given the current situation of shortfall in the supply of this commodity in the sub-region.

5.3 Private sector role in the oil palm industry

The key private sector stakeholders in the oil palm industry's value chain include the input/seedling producers, agricultural equipment manufacturers, farmers/farmer groups, NGOs, financial institutions, transporters, processors, retailers and end-market users. All these actors must play a collective role in enhancing and ensuring area expansion and increasing productivity per ha on existing oil palm farms and ensuring quality produce through collaboration with various tiers of government to execute and operate major programmes and projects in the industry.

Given the prominence of the private sector in driving the supply and product chains, strengthening management of the chain actors is the responsibility of a private sector umbrella. Strengthening contracts and ensuring the success of existing linkage arrangements must be a high priority.

Private sector actors, although driven by profitability motives, must ensure effective management of their agribusinesses to enhance sustainability. Most successful private oil palm estates have invested in research with the objective of controlling their most fundamental input: planting materials. Joint asset ownerships with farmers (nucleus-outgrower schemes, for instance) are likely to commit both parties to the linkage partnership because economic returns from that asset depend on the success and sustenance of the linkage. Several large oil palm projects have been established by several private sector entities in West Africa (Table 18, Figure 7).

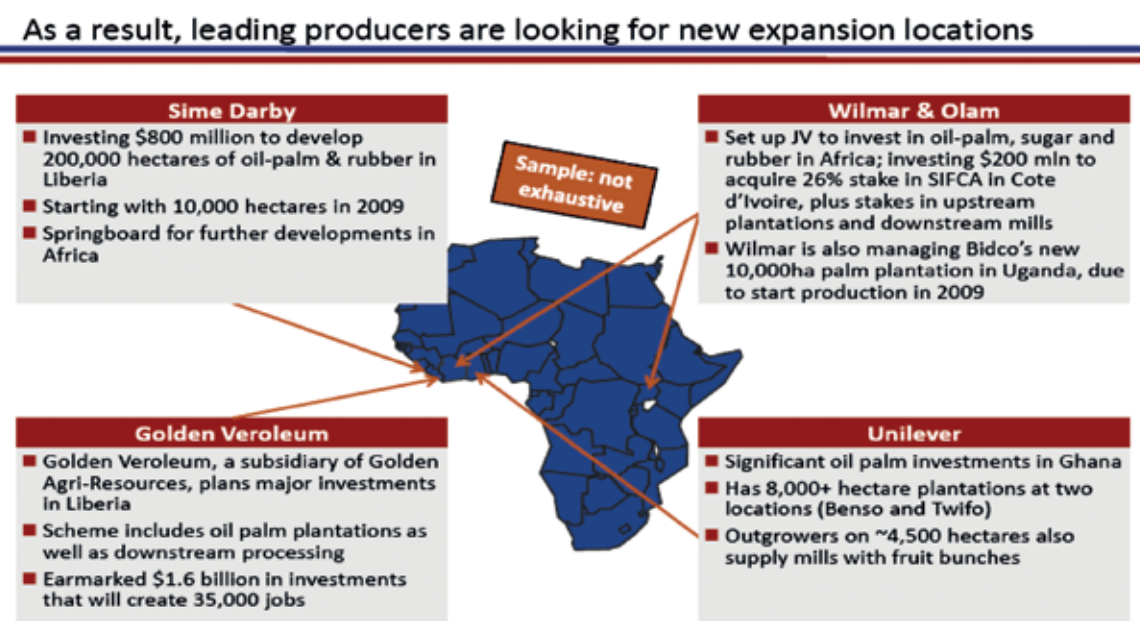
Table 18. New Large-scale Oil Palm Projects in West Africa

Countries	Project Name/Investor	Area (ha)	Investment Amount
Nigeria	Fri-El Green Power (Italia) extension of plantation	100 000	-
Nigeria	Wilmar to invest in oil palm plantation	30 000	-
Côte d'Ivoire	Wilmar and Olam joint venture to invest in palm oil and other commodities		USD 200 million for acquiring stake in SIFCA group plantation
Cameroon	Sime Darby (Malaysia)	300 000	

Table 18. New Large-scale Oil Palm Projects in West Africa (Cont.)

Countries	Project Name/Investor	Area (ha)	Investment Amount
Sierra Leone	Sierra Leone Agriculture (UK-based company)	30 000	-
Sierra Leone	Gold Tree (UK group)	planned	
Sierra Leone	QUIFEL	planned	
Guinea	National policy of palm oil development objective 2015	government plan	
Liberia	Sime Derby (Malaysian company)	180 000	USD 20 million
Liberia	Equatorial Palm Oil	169 000	USD 50 million ⁸
Liberia	Golden Agri Resources	240 000	USD 1 600 million ⁹
Liberia	SIFCA (West Africa groups)	8 800 and 6 000 (outgrowers)	USD 64 million ¹⁰

Source: Compiled by the authors from various sources.

Figure 7. New Project Maps in the Region

Source: Compiled by the authors from various sources.

⁸ **Source:** <http://www.afriqueavenir.org/en/2011/02/15/uk-company-commences-us50-million-oil-palm-investment-in-liberia/>

⁹ **Source:** <http://allafrica.com/stories/200912010009.html>

¹⁰ **Source:** <http://www.netnewspublisher.com/liberian-government-and-sifca-sign-64m-oil-palm-oncession-agreement/>

6. Competitiveness and inclusiveness in the oil palm sector

6.1 Competitiveness and drivers of the oil palm sector

The competitiveness of Ghana's oil palm sector can be described as the sector's ability to sustain trade against the competition in the global market. High domestic costs of production could weaken the sector's export drive and elicit imports. The economic sustainability of the Ghanaian oil palm industry is therefore highly dependent on its trading performance, relative cost structure and internal factors (such as the role of government and private firms in enhancing performance) and climatic factors that confer competitive advantages for the oil palm industry expansion.

Table 19 presents comparisons of production costs, plantation productivity and percentage oil extraction rates (OER) within the sub-region and relative to the world's major palm oil producers, Indonesia and Malaysia. The cost competitiveness of Ghana and the sub-region producers has been assessed, relative to the producers of Indonesia and Malaysia.¹¹ It is estimated that the Asian producers derive economies of scale through their large-scale production; this is reflected in the current production cost of USD 350/MT, as against USD 400-450/MT in West Africa. Within West Africa, Ghana had the lowest cost of production, at USD 270/MT (2004), compared with USD 293/MT and USD 303/MT in Nigeria and Côte d'Ivoire, respectively. However, this position has been lost as costs have risen to an average of USD 400-450/MT across West Africa. Ghana's cost of production for processing is varied and reflects different elements represented in the cost composition. The large-scale operators have production costs of USD 500-700/MT of CPO (Unilever, 2010). Medium-scale operators have a relatively lower cost of USD 536/MT, while small scale operators have the lowest cost, at USD 85/MT. These discrepancies are the result of flow overheads, administrative costs, pensions and other cost elements that feature in production by large and medium operations.

Assuming the current cost structures, Ghana and the sub-region's production structures are relatively competitive, but the oil palm sector needs to further cut the costs of production. The small-scale palm oil producer in Ghana appears highly competitive, unless quality standards become too stringent placing smallholders out of competition. Ghana's estimated CPO output is less than 1 percent of total global output, in contrast to Indonesia and Malaysia's combined share of 70-80 percent. The drivers of the oil palm industry in general can be seen in the expanding market and increased demand for oil palm products worldwide, for food, industrial processing and biofuel, as a consequence of population increases and the high cost of coal fuel.

To improve its competitiveness (through lower costs and enhanced internal factors), it is suggested that Ghana compete on the basis of cost and quality in the CPO markets of the south-north corridor of the West African sub-region, in order to gain further opportunities and cost advantage over the Asian countries.¹² The data on cost tend to suggest that small-scale producers, with CPO production costs of USD 85/MT, can compete most successfully against the Asian producers, but CPO quality must be improved to realize this potential.

Lowering the costs of production also requires increasing productivity. There is a wide variation in the productivity of oil palm production in Ghana among the different farm structures. Productivity increases must be driven by several factors: (a) government support of the palm oil industry through clear and proactive government policy stimulation and private sector collaboration and the provision of basic infrastructure such as access roads, schools, hospitals and recreational facilities to attract investments.

¹¹ Oil palm study (ADVANCE 2010)

¹² ADVANCE (2010) report

Table 19. Comparison of Production Costs, FFB Yield and % OER—Ghana and Major World Producers of Oil Palm

COUNTRY	Area Under Cultivation (ha)	FFB production (MT)	Plantation Productivity (FFB Yield) MT/ha	Oil Extraction Rate (OER) (%) (average)	Average Production Costs/MT (USD)*
GHANA**					\$270
GOPDC				0.23	
Nucleus Estate (MT)	4 650	41 386.8	8.9		
Outgrowers (MT)	13 000	54 223.1	4.2		
Smallholders (MT)	3 500	7 397.2	2.1		
Okumaning (MT)		3 508.4			
Private Farms (MT)		2 177.7			
<i>Twifo Oil Palm Plantation</i>				0.19	
Nucleus Estate (MT)	4 500	52 153.5	11.6		
Smallholder FFB (MT)	2 800	12 927.6	4.6		
Purchased FFB (MT)	8 000	31 317.9	3.9		
<i>Benso Oil Palm Plantation</i>				0.19	
Estate FFB (MT)	4 666	41 631.3	8.9		
Smallholder FFB (MT)	1 650	16 647.8	10.1		
Purchased FFB (MT)	5 000	26 574.8	5.3		
<i>Juaben Oil Mills</i>				0.20	
Outgrower	1 100	2 776.4	2.5		
Nucleus	424	968	2.3		
<i>Ghana: Private Smallholder</i>	232 833			0.10	
Large-scale					\$536
Medium-scale					\$85
Small-scale					\$500 - \$700
NIGERIA***	2 5140 90				\$293
Wild grove	2 300 00		1.5	0.1	
Smallholder	117 25				
Estate	96 65		5.0	5.0	
CÔTE D'IVOIRE	250 00				\$303
MALAYSIA			30-35		\$350
INDONESIA			30-35		

Sources: * Oil Palm Study (ADVANCE, 2010) ** Average figures (2000-2007) *** Oil Seeds Association of Nigeria (2003)

6.2 Assessment of the role of smallholders in the oil palm sector

A. Role for the smallholder in a private sector-driven industry

Smallholder farmers in the oil palm industry need to empower themselves through training, facilitation, and networking. Formation of groups and ensuring that these groups are facilitated and sustained are crucial steps. Smallholder farmers need to share knowledge (local and accessed) in farm and agronomic management through linking with "expert farmers", who provide a rich source for identified technologies in input use and the sharing of experiences.

Group formation is also important for farmers to foster communication links, to develop independent activities and to build social solidarity about their activities and networking by holding farmer workshops with the support of NGOs. Researchers and NGOs can build farmers' capacity through structured, on-going dialogue with farmers through farmer groups to identify priority problems, suggest and try out possible solutions, and disseminate technologies and information judged useful by both researchers and the farmer groups.

B. Role of government in promoting smallholder farmers in a private sector-driven industry

Clarifying public and private roles in improving support services, including improved delivery of agricultural research, extension, training, regulation, information and technical services and finance is critical to increasing smallholder farmers' production and productivity. Increased private sector participation in the oil palm industry in general requires the creation of a favorable climate for commercial activities. This includes ensuring a stable macroeconomic environment and strengthening the institutional framework that links the value chain actors for managing the industry in the country.

In the FASDEP II, government strategies for rubber, oil palm and coconut identify such constraints as: (a) unavailability of high-yielding planting material; (b) poor agronomic practices; and (c) cultivation of small holdings. Government is addressing these constraints through collaboration between MoFA and the Ministry of Trade and Industry (MoTI), private sector development and PSI to attract private sector investment in these industrial crops and to promote the outgrower-nucleus farmer linkage as a way of improving smallholders' access to credit, extension on improved agronomic practices and capacity to expand farm size. These organizations, in collaboration with external research institutions, will also encourage the building of research capacity for these industrial crops.

At the moment these linkages appear weak, as demonstrated by the uncoordinated roles of the various actors in the chain. In particular there is a need to define what government, at the central and local levels, can and cannot do with respect to the role of the private sector in the development of the industry, keeping in mind that smallholder, private farmers dominate the sector and need to be promoted. Strengthening the capacity of actors in the chain and improving their coordination will play a key role in the development of the oil palm industry.

Improving net farm returns for smallholders in the short term and intensifying the oil palm industry's commercializing structure in the medium and long term both require attention to marketing inputs and outputs. These tend to be facilitated by government entities. For instance, MoFA's input subsidy on fertilizers and MoTI's inter-ECOWAS trade facilitation are both important for pursuing these goals.

Agricultural diversification and enhancement of rural livelihoods in the oil palm districts are also strongly influenced by deliberate public policy. Smallholder oil palm farmers' access to input and output markets is facilitated by improved access to infrastructure, including health facilities. It is crucial to have public policy that incorporates planning for agricultural development in other sectors, so that due attention is paid to issues such as rural infrastructure development, the impact of HIV/AIDS and malaria, youth migration and environmental management.

Strategies to address gender mainstreaming in the oil palm districts must be wide-ranging and based on public/private sector collaboration in appreciating and understanding gender issues. The public sector will have to lead in devising strategies that target female farmers for specific activities through intensive gender sensitization. For example, the relative level of participation by women compared with men in decision-making and in access to and control over resources and benefits has not been adequately addressed. A lack of conscious planning to address these imbalances may result in men and women having unequal access to the resources and benefits of the industry.

To ensure increased control over resource use efficiency and benefits for the smallholder female farmers in the oil palm industry, one option may be for extension agents/researchers to ask their male farmer contacts to include their wives during visits, demonstrations or farmer meetings, and to skew a greater percentage of their time to working with women's groups in the industry to find solutions to technical problems specific to women farmers' production systems and to promote farmer-to-farmer exchange among women in the industry.

C. Policy initiatives to enhance productivity of the smallholder farmer

Policy initiatives targeted at the smallholder include the encouragement of estate-outgrower schemes to enhance farmer access to best practices in oil palm agronomic management. GOPDC, TOPP and BOPOP are examples of programs that have enhanced the productivity of the smallholder farmer.

In addition, schemes undertaken under the PSI are still in place for the smallholder farmers. Several nurseries are currently operational, established through private operators in the Western, Eastern, Ashanti, Central and Brong Ahafo regions. It is estimated that a total of 2.84 million seedlings have been produced from 2004 to 2006 and farmers have been mobilized and supported. However, the PSI scheme requires strengthening; its impact has been limited as a result of failure to link farmers through a technical operator, and lack of proper supervision.

The government's subsidy on fertilizers has led to an increase in productivity and production at reduced costs per unit area. Ready markets for the smallholder farmer in terms of sale of FFB have been facilitated by the private oil palm estates. For example, it is estimated that BOPP alone purchased 11 933 MT of fresh palm fruits valued at GH¢11.8 from 438 smallholder farmers in 2010.

7. Conclusions

In conclusion, we return to the key questions as to whether and to what extent an expanding palm oil sector can be inclusive of smallholders and how to ensure that the sector's growth is climate-smart and environmentally sustainable.

The future of the palm oil production in Ghana rests with the smallholder productivity increase as estate farms currently comprise about 25 percent of cultivated land. Smallholder producers and processors are optimistic about expanding in the future. They see the need for expansion to produce oil palm and other products. Their reasons to expand their production and processing activities are to meet the high demand from exporters and to increase their income from processing.

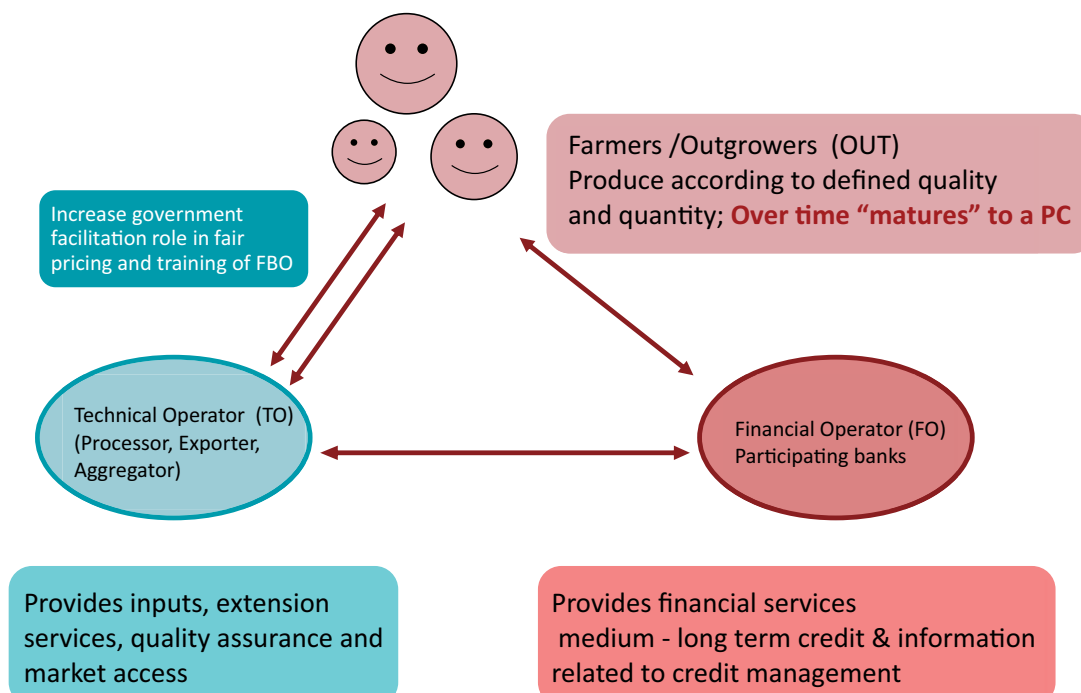
Analyses from the field work on inclusion of the smallholders, however, suggests that management and governance in the nucleus-outgrower model are not strong. There are no viable farmer-based organizations (FBOs) that interact with an estate on a sustainable basis and no sense of belonging to the estate, because they have no strong motivation to participate. Smallholders complain of increasing costs of inputs supplied (fertilizer) and the erosion of profits. It is also an issue that there is no platform for fixing of FFB prices along with arbitrariness in fixing the percentage of FFB income for loan repayments.

Pressed as to why their interest in this model had diminished, the smallholder farmers, particularly the former outgrowers, explained that their contract was on a co-financing basis. It was unclear what should occur once their loans were paid. They indicated that the number of palm oil mills has increased, a competitive market for smallholder produce has developed and many smallholders now sell their produce to mills offering the highest price even though they may be under a legal obligation to sell to the nucleus estate.

A major focus of the agribusiness chain actors in the oil palm industry for smallholder farmers in Ghana is on providing inputs and increasing productivity through enhancing farmers' knowledge and skills and their access to local and international markets. However, there is a growing awareness that smallholder farmers face particular constraints that need holistic support to be successfully addressed. Mechanisms that assist smallholder farmers in decision-making, understanding and accessing markets, agricultural knowledge and information systems, science and technology and equal opportunities for gender participation in the industry may transform the role of the smallholder for the rapid expansion needed.

The government recognizes that the key role of the smallholders requires concerted government and private business coordination. The current national plan for development of the oil palm industry is premised on the private sector-led initiative facilitated by the government through outgrower schemes. The main strategy is to link outgrower schemes through a technical operator (TO) such as TOPP and BOPOP (see Figure 8) to enable smallholder farmers to sustain their production. Figure 8 provides a model that is likely to meet aspirations of all the stakeholders. Outgrowers (OUT) are enabled by government facilitation, which is key for meeting the public objective of capacity building of farmers. The technical operator (TO), who is simply the nucleus/estate, is guaranteed continuous supply of FFB through facilitation by a financial operator (FO).

Figure 8. A Model Inclusive of Smallholder Farmers for Oil Palm



Source: Adapted from OVCF

The farmers' participation in the chain is enhanced and they are offered a fair deal for the supply of FFB. This concept has long term development and sustainability prospects as the two main parties (TO and OUT) feed off each other. With the TO's inputs and technical/management, the plantation company (PC)/OUT) sustainably increases plantation area and increases yields. Given the competitiveness of the market (e.g. diversion of FFBs) the FBO requires training and skills development to attain the PC capacity level to enhance negotiation, lobbying and market research.

Thus the focus on policy interventions, including the medium term objectives previously described, is worthwhile and needs to be promoted for smallholder inclusiveness. Smallholder farmers and processors in the oil palm industry may need to play critical roles in decision-making that can build their social capital and hence influence policy decisions, understanding markets, acquiring agricultural knowledge and information systems and accessing science and technology.

The recommendations derived from the analyses and conclusions in this chapter are as follows:

- (a) The nucleus/estate smallholder oil palm project development must emphasize principles of participatory development, in which the farmers are the subject and not the object of development initiatives, by ensuring that the smallholder farmer becomes a viable, progressive, and self-reliant farming entity;
- (b) The concept of joint asset ownership should be enhanced. (In a competitive market, many smallholders sell their produce to mills offering the highest price, even though they may be under a legal obligation to sell to the nucleus estate. Joint asset ownership may commit smallholder farmers to the linkage partnership because their economic returns would depend on the success and sustenance of the linkage.)
- (c) Smallholder farmers need intervention/assistance from all stakeholders to ensure environmental sustainability. (Farmers generally lack the capital and technical expertise required to recapitalize the low fertility status soils in degraded land where there are opportunities for oil palm development.)

Recommended Business Model

There are several possible configurations that could be adopted, but the one considered perhaps the most appropriate is a company formed along the following lines:

- a. Milling Investor (Lead Investor, TO) takes 85 percent equity share in consideration of the value of the installed mill, and full management control.
- b. Plantation company (Outgrower, PC), as a legally registered company, takes 15 percent share in consideration of the existing standing palms.
- c. Besides being paid cash at the going rate for their FFB supply, PC also takes a profit share of the company, up to a maximum of 20 percent of net profit. The actual percentage could be performance-based.
- d. The company takes full responsibility for repaying amounts owed by farmers for seedlings, and also for the value of the nursery operation.
- e. The company recovers the cost of seedlings from individual farmers on group terms.

The above format meets the needs of all three parties:

- a. The milling investor is guaranteed continuous supply of FFB for the mill;
- b. The farmers have real participation, and a fair deal for the supply of their FFB;
- c. The GoG (FO) partially recovers its investment funds

The concept has long term development prospects, especially with the nursery included as an essential element. With a continuous supply of seedlings being distributed and planted, the total planted area can continue to expand, along with the capacity of the mill, and of the business generally. The two main parties to the company feed off and support each other. The miller provides seedlings, credit facilities, field extension services, fertilizer and chemicals, while the farmers provide an increasing quantity of FFB as a result of increased productivity. Increased plantation areas will lead to increased yields, leading to larger mills and thus higher CPO production.

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