

Fluctuating oil palm prices in Uganda: impacts and risks involved



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Summary

This study was undertaken to explore the experience of oil palm pricing around the world, scrutinise the pricing model adopted in Uganda for its smallholder farmers. The study aimed to identify risks that such pricing formulae present to the value chain, and resultant impacts of pricing mechanisms on smallholders, business and the economy, before making concrete proposals and recommendations on how risks and negative impacts may be overcome. The challenge of fluctuating oil palm prices and their livelihoods impacts were highlighted in an earlier study on economic trajectories of oil palm (Masiga et al., 2019). The trade-off created when establishing oil palm plantations means that long term economic and livelihood security in Kalangala and Buvuma districts depends on viable and stable oil palm prices, though farmers in Kalangala district have been complaining of falling prices for their oil palm fresh fruit bunches (FFBs) since 2013. The assessment period considered for the study was 2019-2020 when 65% of oil palm out-grower farms in Kalangala were estimated to be in harvest. All oil palm out-grower farms are expected to be in harvest by 2021.

The findings show that the pricing formula as applied in Uganda is an accurate calculation of international market pricing adopted from the Malaysian oil palm price formular. Among the few remaining options for improving FFB prices is to reduce the coefficient in the milling constant (J) which is related to technology efficiency and operational costs of the mill.

Whereas the pricing approach may seem like the major challenge for farmers, payment schedules also weigh heavily on many out-growers. According to the VODP2/ MAAIF Annual report 2017-18, farmers receive about 64% of the sales revenue, while 36% goes to repaying their loan capital plus interest. In addition, under the current system organised under the NOPP in Kalangala, farmers harvest FFBs and deliver them to collection points from where they are weighed in the presence of the harvesting clerk and the farmer or his representative. But implications in the final price is also related to quality, any rejected produce and transportation costs, all of which should be more transparent for farmers.

An alternative to the processor controlled pricing system employed in Uganda is the free market system of pricing is employed in the West African states of Ghana and Nigeria. The free market system is largely based on a large domestic market with palm oil processing dominated by local traders. The free market system does not guarantee farmers a better price. Indeed, buyers often pass on costs such as transportation from remote areas, and may mislead farmers regarding quality assessments, leading to lower prices for farmers. In addition, the free market has the challenge of having to compete with countries with more efficient production and cheaper exporters such as Malaysia and Indonesia, which can further depress the domestic industry.

The main risks of poor pricing mechanisms are the disincentive on oil palm farmers, and distortions of the value chain. Disincentives to farmers lead to lower effort, productivity and output, impacting significantly on the industry. For farmers, lower yield leads to a higher proportion of costs associated with loan repayments further reducing income. Farmers may then transfer poor incomes into more environmental degradation either to expand production, or seek alternative but unsustainable income sources, e.g. wood fuel cutting, charcoal production, and farming in wetlands.

Whereas Uganda's pricing mechanisms is sound, it exposes farmers to more competitive farming systems and value chains in Malaysia and Indonesia that have existed for over 40 years. Even if some differences in the context have been integrated into government support, others such as high labour demands leaving limited time for food crop production and other employment have not been fully considered. This means that the pressure on farmers to earn a good income from oil palm to provide for household needs is quite high. Impacts of oil palm can be seen in the per capita incomes of people in Kalangala district. Current incomes from oil palm even after reducing the costs of credit and transport, has allow them to rise to lower middle income level. However, they are unable to significantly impact the economy of their communities unless they are able to move from lower middle income (US\$1,025-4,035 per capita) to upper middle income (>US\$4,035 per capita). Moreover, they remain vulnerable to lower incomes if prices of oil palm FFBs fall, or their credit and transaction costs increase.

Conclusions and recommendations

- The pricing approach used in Uganda is adequate for a standard value chain comprising supported smallholders, and can also be applied to independent smallholders if they can meet their own farm input and transport costs.
- A buyer-driven market is possible if the oil palm strategy under development seeks to fast track the growth and expansion of local small scale processing and production across the country.
- For buyers to determine the price, the national instrument, the pricing formular, is needed to ensure that the prices paid to farmers remain within a range of international market prices.
- For a domestic market strategy to achieve export substitution, oil palm and other vegetable oils must be competitive against exports from more efficient exporting countries such as Malaysia and Indonesia.
- It is essential to provide transparent information to farmers regarding their loan repayments, and the impact that this has on their incomes from fresh fruit bunch sale as many do not realise that payments from KOPGT have transport costs and loan repayments already deducted.
- Farmer organisations such as KOPGT should be used to support price stability by negotiating with farmers and buyers so price peaks and troughs are smoothed out throughout the year, supported by transparent systems usually used by cooperatives that allow farmers to receive consistent prices over the long-term with agreements on how to share revenues or losses incurred.



Introduction

The Vegetable Oil Development Project (VODP) was approved by the International Fund for the Agricultural Development (IFAD) Executive Board in April 1997, with implementation starting in 2002, with the first planting of oil palm in Kalangala district in 2005 (Ssemmanda and Opige, 2018). It ran until 2011 with the overall objective of increasing smallholder incomes through domestic vegetable oil production (IFAD, 2011). There were three sub-projects; (i) introduction of commercial oil palm production on Bugala island, Kalangala district, (ii) development of commercial oil seeds in northern, eastern and mid-western districts, and (iii) research and development of essential oil crops piloted in several districts. The second phase (VODP2) was approved by IFAD's Executive Board in April 2010 and the Uganda Parliament in September 2010, implemented under three components; oil palm development, oil seed development and project management. A total of 10,924 hectares of oil palm was planted, comprising of 6,500 hectares of nucleus estates and 4,424 hectares of smallholder farms (MAAIF/Parliament, 2018).

In April 2018, Uganda's National Oil Palm Project (NOPP) was approved by the IFAD Executive Board to replace VODP and run from 2019 to 2029, drawing on experiences from VODP2. The three components of NOPP are; (i) scaling up investment in smallholder oil palm production, (ii) livelihoods diversification through maximising benefits from the improved incomes from oil palm and promoting sustainable inclusive livelihoods from crop farming and other enterprises, and (iii) oil palm sector development including enabling conditions for sustainable scaling up and long-term development of the sector, with a policy instrument and a sustainable institutional structure. The institutional roles and responsibilities under NOPP include the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and the Ministry of Finance, Planning and Economic Development (MoFPED) as the lead agencies for government. MAAIF coordinated implementation while MoFPED supports resource mobilisation, disbursement and oversight over resources use. The implementing is carried out by the District Local Government(s), National Agricultural Research Organization (NARO), Uganda National Bureau of Standards (UNBS), Vegetable Oil Development Council (VODC), Kalangala Oil palm Growers Trust (KOPGT), and Oil Palm Uganda Limited (OPUL), among others (See Annex). During VODP, 1,810 outgrowers (36% women) benefitted from project extension and marketing services in Kalangala, with annual production of crude palm oil increasing from 4,692 tonnes in 2010 to 37,363 tonnes in 2018 (MAAIF/VODP 2019). The 1,810 registered smallholder farmers in Kalangala received UGX 34.5 billion (US\$9.2 million) for site preparation, maintenance and inputs, and the project recovered UGX 15.3 billion (US\$4.1 million) of this from smallholders. Smallholder in Kalangala harvested 86,838 t of oil palm fresh fruit bunches (FFB) valued at UGX 39 billion (US\$10.4 million), and by 2019, annual FFB production reached 26,889 t with a value of at UGX 15.7 billion (US\$4.2 million), produced by 1,074 outgrowers from 3,021 hectares of oil palm.

However, even with the increasing production reaching 37,363 tonnes in 2018, Uganda still had a palm oil deficit of 80,000 tonnes that year (MAAIF/ Parliament of Uganda, 2019). Similarly, the regional demand for vegetable oil stood at 3 million tonnes, with annual imports of crude palm oil standing at 1.4 million tonnes (MAAIF/Parliament,

2017). Beyond the production of vegetable oil, palm oil is very versatile, it can be easily separated into solid (stearin), and liquid (olein) components for use in hard products such as soaps and margarines or liquid products such as oils and lubricants. Palm oil is a ubiquitous ingredient for processed foods, cosmetics, detergents and many industrial applications (OECD/FAO, 2019). Many of these products fetch a high value in both domestic and regional markets, and alternative values must be included in the pricing formula to boost FFB price and maintain the production cycle.

Rationale and methodology

The challenge of fluctuating prices of oil palm and the livelihoods impacts were highlighted in a work on economic trajectories of oil palm (Masiga et al., 2019). This showed the trade-off created by establishing oil palm plantations means that the long-term economic and livelihood security in Kalangala and Buvuma districts depends on viable and stable oil palm prices, and projected direct impacts of oil palm on agriculture production and indirect impacts on food security and forestry-based ecosystem services. Masiga et al. (2019) recommended that the government should consider breaking the monopsony (single buyer) of the oil palm value chain to give farmers a wider choice and allow them to obtain competitive prices. In the design of the project, IFAD, the World Bank and the Government of Uganda recommended a pricing mechanism that was incorporated into project implementation to ensure that smallholder farmers receive a fair and equitable price for their produce. The pricing policy adopted was based on a pricing formula originally used in Malaysia where farmers supply a single mill, and ensures that it is not a private investor who determine the price of fresh fruit bunches but that it is objectively based on the performance of palm oil in the market. Since 2013, farmers complained of falling prices for their FFBs, which directly affects farmer incomes, and consequently their welfare and ability to meet their household needs. The pioneer farmers who first planted started harvesting FFBs in 2010, with many taking out loans from the project loan facility to clear land, hire workers and purchase inputs (Bigirwa et al., 2019). By the end of 2019, it was estimated that 65% of oil palm farmers in Kalangala were harvesting FFBs and all farmers are expected to be harvesting by 2021.

This report seeks to contribute to the sustainability of the palm oil value chain in Uganda by encouraging fair pricing, and provides recommendations to ensure price stability for FFBs and crude palm oil. The overall objective was to study fluctuating prices of oil palm, the impacts, and risks in the oil palm value chain in Uganda. Specific objectives were to (i) explore the experience of oil palm pricing around the world, (ii) scrutinise the model adopted by Uganda for smallholder farmers, (iii) specify the risks that such pricing formulae present to the value chain, (iv) identify resultant impacts of pricing mechanisms on smallholders, businesses and the economy, (v) offer concrete proposals and recommendations on how risks and negative impacts may be overcome, and (vi) prepare a policy brief on pricing mechanisms risks and implications to Uganda's smallholder oil palm growers.

This study was based on secondary data and literature reviewed and synthesised from oil palm producing countries around the world. Secondary data from Uganda was drawn from reports by district governments, IFAD, the Ministry of Agriculture Animal Industry and Fisheries (MAAIF), Vegetable Oil Development Project (VODP) and many studies coordinated by Ecological Trends Alliance and Tropenbos International. Analysis was based on descriptive presentation of secondary data using excel and a synthesis of literature and meeting notes.

Oil palm pricing around the world

Global palm oil production and trade

Southeast Asia is the main production region, with Indonesia, Malaysia and Thailand as the three leading countries. South America is the second largest producing region, with Colombia, Ecuador, Honduras and Brazil among the top ten producing countries in the world. Africa has Nigeria and Côte d'Ivoire among the top ten, with Mexico and the Dominican Republic in North America, and Papua New Guinea in Oceania as other leading oil palm producing countries. Indonesia and Malaysia, the top two, produced 84% of the world's palm oil in 2019 (Table 1), and the five leading countries together produced 92% of global palm oil (FAO, 2019). Uganda does not feature among the top 28 countries according to USDA/Index Mundi (2019).

Whereas Nigeria is the fifth largest palm oil producing country in the world, with 1.03 million tonnes or 1.5% of total global output (USDA/Index Mundi, 2019), it is not the leading palm oil exporter in Africa due to very high domestic demand. The largest exporter from Africa in 2018 was Benin (Figure 1), and Côte d'Ivoire and Ghana also exported more than 100,000 tonnes, and even Kenya and Togo exported more than Nigeria.

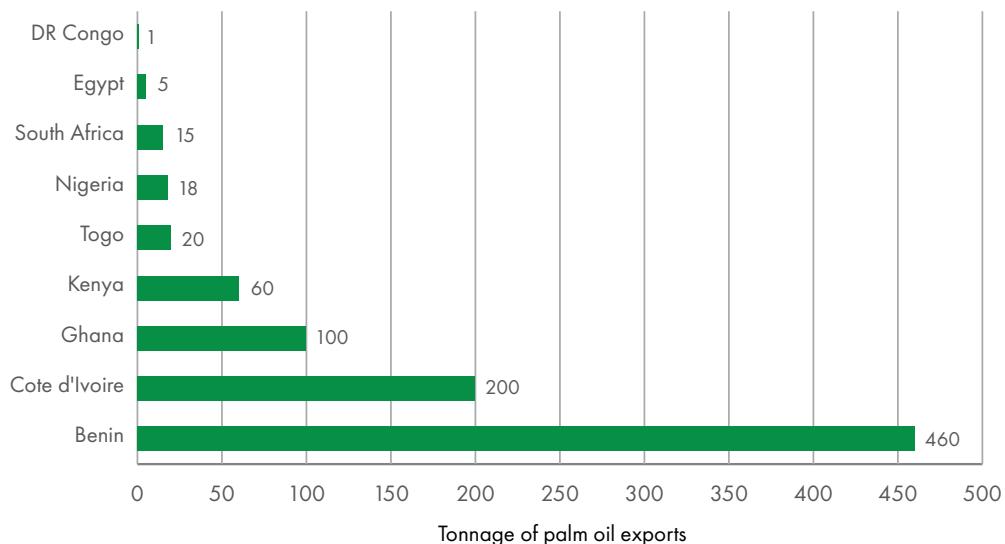


Figure 1: Leading palm oil exporters in Africa. Source: USDA/Index Mundi (2019)

Table 1: Leading palm oil producing countries in the world

Rank	Country	Continent	Oil palm production ('000 t)
1	Indonesia	Asia	42,500
2	Malaysia	Asia	19,800
3	Thailand	Asia	3,000
4	Colombia	South America	1,680
5	Nigeria	Africa	1,015
6	Guatemala	South America	852
7	Ecuador	South America	630
8	Honduras	South America	580
9	Brazil	South America	540
10	Côte d'Ivoire	Africa	515
11	Papua New Guinea	Oceania	510
12	Cameroon	Africa	465
13	Ghana	Africa	375
14	Democratic Republic of Congo	Africa	300
15	Costa Rica	South America	270
16	India	Asia	200
17	Peru	South America	193
18	Mexico	North America	140
19	Philippines	Asia	90
20	Benin	Africa	70
21	Dominican Republic	North America	53
22	Angola	Africa	50
23	Guinea	Africa	50
24	Liberia	Africa	42
25	Sierra Leone	Africa	36
26	Venezuela	South America	15
27	Senegal	Africa	14
28	Togo	Africa	9

Source: USDA/Index Mundi (2019)

Oil palm, soybean, and rapeseed are the most consumed oil crops worldwide (FAO/OECD, 2019), with palm oil's high consumption being mostly attributed to its versatility. Soybean oil consumption is substantial as a by-product of soybean meal's high usage for animal feed in livestock industries, whereby the high volume of residual oil is then exploited. Rapeseed oil consumption is attributed to its health benefits. In terms of average annual productivity of palm oil (4.09 t/ha), it is 11 times more productive than soybean (0.37 t/ha), 8 times more productive than sunflower (0.50 t/ha) and 5 times more productive than rapeseed (0.75 t/ha) (ACET, 2017).

In 2018, global production and consumption of palm oil reached 70.6 million tonnes and 66.4 million tonnes, respectively. Among the major importers of palm oil, India is the largest with 18.6% of world imports in 2018, followed by the European Union (15.3%), China (11.5%), and Pakistan (6.5%). In 2014-2018, global demand for crude palm oil grew by an average of 3.4% per year, driven by rising demand for both direct consumption and to produce alternative energy. Meanwhile, crude palm oil production rose at a slightly faster pace, averaging 4.5% per year.

Table 2: World vegetable oil consumption

Source	Consumption (Mt)	Notes
Oil palm	41.31	The most widely produced tropical oil, also used to make biofuel
Soybean	41.28	Accounts for half of worldwide edible oil production
Rapeseed	18.24	One of the most widely used cooking oils. Canola is a trademarked variety
Sunflower	9.91	A common cooking oil, also used to make biodiesel
Peanut	4.82	Mild flavoured cooking oil
Cottonseed	4.99	A major food oil, often used in industrial food processing
Palm kernel	4.85	From the seed of the African palm tree
Coconut	3.84	Used in soaps and cooking
Olive	2.84	Used in cooking, cosmetics, soaps and as a fuel for traditional oil lamps

Source: ACET 2017

It was estimated that some three million smallholders are involved in palm oil production worldwide (Rival and Levang 2014). Their numbers are increasing, and this has an important influence on pricing. However, the way smallholders contribute differs significantly between regions. In West and Central Africa, smallholders are the dominant producers (Proforest, 2014), and Vermeulen and Coade (2006) estimated that 90% of FFBs were produced by smallholders. In Uganda, smallholders occupy 4,700 ha under Kalangala Oil Palm Growers Trust (KOPGT) compared to 6,500 ha of nucleus estates under Oil Palm Uganda Ltd. (OPUL) control. In Latin America, the proportion of land occupied by smallholders ranges from 68% of 7,300 ha in Honduras, to 8% (12,000 ha) in Brazil. The numbers of smallholder oil palm farmers are quite large across Latin America, mostly working as part of cooperative groups on communal lands (Proforest, 2015). In Southeast Asia, oil palm was originally a government- or privately-owned monoculture plantation crop that used hired labour. Smallholders were included only much later, when they were part of resettlement schemes strongly tied to mills such as in nucleus estate plasma schemes in Indonesia, and through the Federal Land Development Authority in Malaysia (Jezeer et al., 2018). Unlike Indonesia and Malaysia, the majority of Thai oil palm production comes from over 120,000 smallholders throughout the country (Sinsuphan, 2016). Malaysia's oil palm cultivation comprises areas under plantation companies (estates), government agencies, organised and independent smallholders. The independent smallholders sector plays a significant role in the Malaysian oil palm industry as its share has been continuously increasing from 14% of the total oil palm area in 2013 to 16.3% (0.93 million hectares) in 2016 (MPOB, 2016). In Indonesia, there are three types of oil palm plantations: (i) private plantations, making up 53% of Indonesia's oil palm production area, (ii) smallholder farmers with around 40%, and (iii) production under state control with just 7% (Purnomo et al., 2020).

Oil palm pricing strategies in West Africa

Free market approach

Fresh fruit bunch (FFB) pricing in Ghana and Nigeria is generally determined unilaterally by mills and buyers under a pseudo-free market approach, particularly for the domestic market, with FFB prices influenced by factors such as the oil extraction ratio, prevailing palm oil (crude) prices and transportation costs, processing costs and other value

chain costs (Proforest, 2014). Depending on the season and supply of FFB, companies use incentives and discounts in the FFB price determination. However, in such situations, index parameters for pricing are neither controlled nor audited by the government or any neutral agency, a situation which leaves FFB purchase price to buyers and market forces (ACET, 2017). Smallholders in West Africa complained about the apparent lack of transparency in determination of FFB prices. Even though buyers have tried to address their concerns by linking the FFB price to the world market or the Rotterdam World Market (for the EU) pricing of crude oil palm price. FFB pricing mechanisms by nucleus estate are often not documented and not explained to associated smallholders (Proforest, 2014).

Figure 2 shows the main pricing structure for oil palm in Ghana as driven by the largely domestic market, where exports were only 27% of total production (PWC, 2019). The ex-farm price per tonne of FFB depends on which of the two type of palm fruit is offered for sale: Dura or Tenera. The ex-farm price for FFB was US\$50/t for Tenera, and US\$35/t for Dura (ACET, 2014). After harvesting, fruit is transported to processing factories on trucks or transporters hired by the oil palm company. Large-scale processors have their own trucks or tractors, and on average, pay US\$10/t for transport to the processing factory. The ex-factory price of palm oil per tonne is based on the prevailing world market price of crude palm oil, which is the price large mills sell to their customers, mainly soap and cooking oil producers, using the world market price on the last day of the previous month.

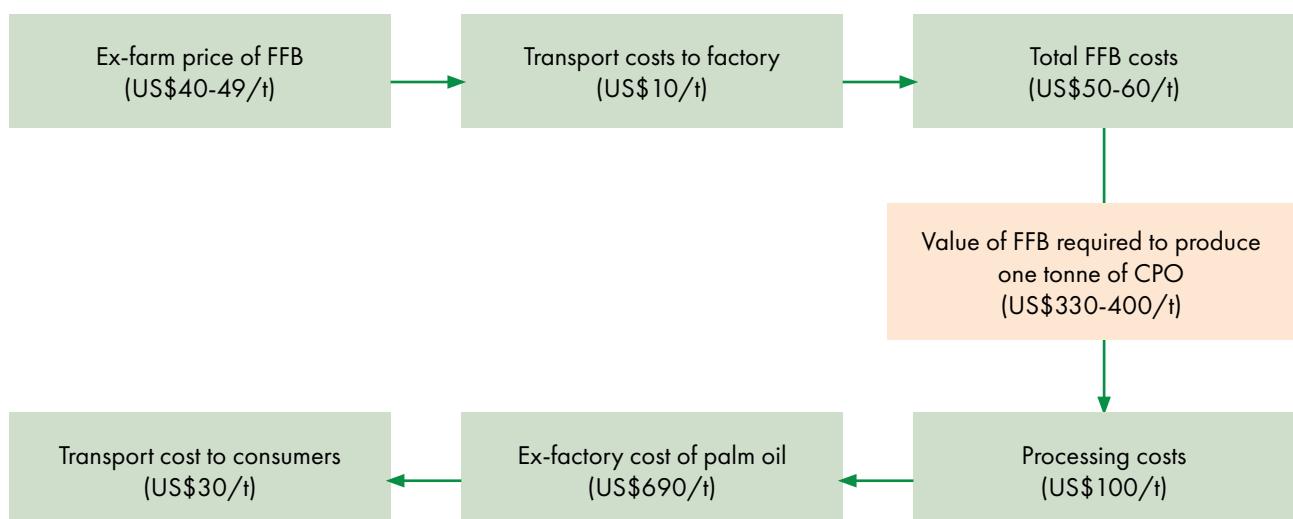


Figure 2: Pricing and cost structure for palm oil for the domestic market in Ghana. Source: ACET (2014)

The completely free market approach has increasingly been overtaken by structured market with pricing based on international market prices even for produce that is traded in the local market. A two tier market system. On the one hand, is a pseudo-free market system of smallholders where buyers determined prices. Alongside the pseuedo-free market system, is a well-structured market with plantations/ smallholders selling to large scale processor and onwards to export market and elite domestic market channel. The second channel relies entirely on international palm oil prices for oil palm FFB pricing, while the pseudo-free market system is indirectly linked to international market prices (Manley and Lensleeye, 2019).

Industry standard prices

In some countries such as Côte d'Ivoire, price is not always determined by competitive market rates, as primary private processing firms may hold the position of the virtual unique buyers for all fruit in a given area. FFB price is determined by the Inter Professional Palm Oil Association (AIPH), the industry association which represents all palm oil professionals in the country. The FFB purchase price is based on a pricing mechanism, but there are many instances where smallholders under contractual obligations with major growers are paid fixed amounts for their FFB and have no bargaining power (Proforest, 2014). Changes to parameters for determining this pricing system require the participation of growers, government and private companies to adjust the open-ended parameters (Cheyns and Rafflegeau, 2005). But this works particularly well given the apparent absence of small non-industrial mills, which were officially banned prior to the government's decision to privatise the oil palm sector. The challenge however, is that the virtual absence of non-commercial mills and a competitive market for FFB means that smallholders do not have market options during mill saturation d peak seasons or when industrial mills break-down.

Oil palm pricing strategies in Southeast Asia

The most widely practiced system is that of the Malaysian Palm Oil Board (MPOB) where the price of FFB is based on the MPOB Daily FFB Reference price that guides smallholders to determine FFB price in relation to CPO and PK prices. The single reference price creates a transparent market in FFB trading, which helps to maintain a harmonious relationship amongst smallholders, FFB traders and millers (Nordin et al., 2001). The Malaysian system is considered transparent because pricing is considered to follow a transparent system, where all the costs including those of the MPOB are clearly described. The formula for FFB price calculation is as follows (Oil Palm FFB Price Calculator, Malaysian Palm Oil Board, Kuala Lumpur, Malaysia).

$$\text{FFB price} = ((\text{CPO price} \times \text{OER}) + (\text{PK price} \times \text{KER})) - (\text{milling cost}) - (\text{MPOB Cess}) \quad (1)$$

Where:

CPO price = crude oil palm price

PK price = palm kernel price

MPOB cess = cess by Malaysian Palm Oil Board

OER = oil extraction rate

KER = kernel extraction rate

In Indonesia, the price farmers receive for FFB is the most important determinant of incomes received by smallholders. The regulated FFB price is set by provincial governments based on the official formula linked to the average CPO prices on global markets (Bronkhorst et al., 2017). The formula used by the Indonesian government is as follows.

$$P_{\text{FFB}} = k \times ((P_{\text{CPO}} \times \text{OER}_{\text{CPO}}) + (P_{\text{PKO}} \times \text{OER}_K)) \quad (2)$$

Where:

P_{FFB} = price of FFB at the mill gate

k = percentage of returns given to FFB producers (farmers, plantations)

P_{CPO} = the CPO price

OER_{CPO} = oil extraction rate for CPO

P_{PKO} = PKO price

OER_K = palm kernel oil extraction rate

The government price in Indonesia has set pre-transaction costs. Therefore, the price received by farmers can be significantly lower and depends on a number of factors, particularly; the quality of FFB and whether the farmers sell directly to a mill, cooperatives or traders. FFB quality and thereby the price is determined during the grading process at the mill. Where farmers are unable to maintain the standard of quality largely due to limited awareness, prices can be markedly lower. Similarly, smallholders who sell directly to a mill or cooperative receive higher prices than those who sell to traders. Ideally, FFB need to be processed within 24-48 hours after harvest. This poses supply chain challenges for smallholders in remote areas. Usually their access to the mill is achieved through traders who often operate territorially as monopolies, and smallholders are forced to accept lower prices to ensure their FFBs are processed in time (Rainforest Alliance, 2016).

In Thailand, the Department of Internal Trade, under the Ministry of Commerce is responsible for setting purchase prices for FFB and palm oil. The purchase price for FFB is set by the Central Committee on the Prices of Goods and Services under the Department of Internal Trade. The Committee specifies a general reference price for FFB based on an agreed level of oil content. In 2017 this was raised to 18% oil content (from 17%), with the intention of encouraging Thai farmers to harvest ripe FFB which have higher oil content, to fetch higher selling prices (Krungsri, 2020). The price for crude palm oil (CPO) is set with reference to input cost (i.e. domestic cost of FFB, milling and other costs) and global price trends for CPO. Given the factors above, the cost of producing palm oil in Thailand is naturally higher than in Indonesia or Malaysia, sometimes up to 10% higher. This restricts the ability of Thai palm oil products to compete effectively in export markets. Hence, around 75% of CPO originating in Thailand is consumed domestically. Exports account for only a small fraction of total output, and which is volatile depending on surplus production (Krungsri, 2020).

Oil palm pricing in Uganda: approaches, risks and impacts

National production trends

Data from MAAIF/VODP (IFAD, 2019) showed that oil palm production in Uganda had increased to 37,363 tonnes in 2018 (Figure 3 and Table 3), and which would have put Uganda as the 25th largest producing nation in the world (Table 1). However, Uganda is a relatively new producer having only started to harvest and process palm oil in 2010, compared to West Africa countries such as Ghana and Nigeria which have been major palm oil producers since the 1960s.

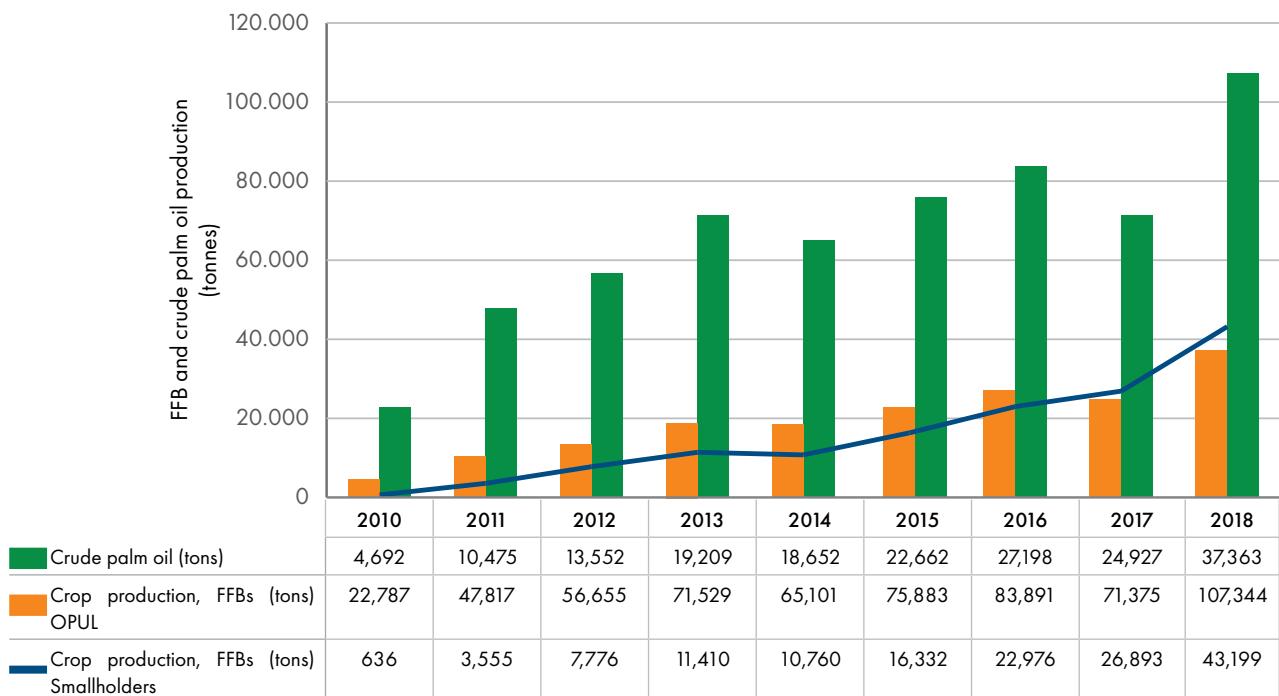


Figure 3: Palm oil production in Uganda. Source: MAAIF/VODP (IFAD, 2019)

Table 3: Oil palm and crude palm oil production in Uganda, 2010 to 2018

Year	Crude palm oil (CPO) (tonnes)	Crop production, fresh fruit bunches (FFBs) (tonnes)	
		OPUL	Smallholders
2010	4,692	22,787	636
2011	10,475	47,817	3,555
2012	13,552	56,655	7,776
2013	19,209	71,529	11,410
2014	18,652	65,101	10,760
2015	22,662	75,883	16,332
2016	27,198	83,891	22,976
2017	24,927	71,375	26,893
2018	37,363	107,344	43,199
Total	178,730	602,382	143,537

As part of VODP's design, IFAD, the World Bank and the Government of Uganda recommended that a pricing mechanism be incorporated as part of the project. Given that there is only one buyer of FFB, the pricing mechanism was intended to protect farmers from the effects of a monopoly, and ensure that they receive a fair and equitable price for their produce. This was then included in Article 9 of the agreement between the government and BIDCO Uganda Ltd. (BUL) signed in April 2003. The tripartite agreement between the government, Oil Palm Uganda Ltd. (OPUL) and the registered trustees of Kalangala Oil Palm Growers Trust (KOPGT) also lays out the composition of the national pricing committee.

The Ugandan pricing formula

The pricing mechanism used in Uganda is an extended adoption of the pricing formula used in Malaysia where farmers supply to a single mill and is meant to protect them and ensure fair prices. The price formula as laid out in the VODP Project Design Document (Article 9) is as follows.

$$\text{FFB price} = (H/J) \times K \quad (3)$$

Where:

FFB price = the factory gate price per tonne of fresh fruit bunches (FFB) of a standard quality

H = the price of the crude palm oil (CPO) ex-mill

K = the oil extraction rate per tonne of oil palm FFB

J = a milling constant fixed at 1.2

The calculation starts with the average world price of the CPO in Malaysia for the previous month, the cost of transport, insurance and freight (CIF) from Malaysia to Jinja is added to this price in order to obtain the import parity price per metric ton of CPO at the refinery in Jinja. From the import parity price at Jinja, the cost of transporting CPO from Bugala island to Jinja is deducted to obtain the ex-mill price of CPO (H).

The agreed milling constant (J) is 1.2 and it is applied to cover the milling costs (operating, repairs, maintenance and depreciation) associated with extracting one tonne of crude palm oil at the mill in Bugala island, Kalangala. The extraction rate (K) reflects the amount of oil recovered or extracted per tonne of oil palm FFBs fed into the mill, in percentage terms. The mechanism means that the prices farmers receive are directly determined by world prices and will fluctuate, depending on international prices of crude palm oil. The company, OPUL, has the option of importing crude oil palm from Malaysia and Indonesia and all the costs involved are incorporated in the formula.

Table 4: Flow chart of value chain costs used for pricing oil palm

Description	Basis	Costing
Costs at Mombasa port		
Free on Board (FOB) value (US\$/t)		530,29
Freight (US\$)	55	55
C&F to Mombasa (US\$)	585,29	
Marine insurance	1.20%	7,02
CIF Mombasa price (US\$)		592,32
Port wharfage per tonne (US\$)	2,20	2,20
Clearing agency fees per warehousing entry/ invoice (US\$)	300	0,67
Trade levy per tonne (US\$)	0,12	0,12
Transit insurance from Mombasa to Jinja (CIF) (US\$)	0,306	1,78
Storage charges at Mombasa per month (US\$)	3,25	3,25
ITS/SGS survey fees per month (US\$)	0,26	0,26
Cost at Mombasa (US\$)		9,35
Transit to Jinja		
Transit charges from MSA to Jinja	\$ 100/t	100
Border clearance (UGX/t, on a 28 tonne truck)	32	1,4
Costs to Jinja		
Exchange rate price (UGX)	3,696.75	2,598,111
Landed cost at BUL Jinja/ tonne CPO (UGX)		2,598,111
Extraction rate	23%	
Milling constant	1,2	
Transport from Kalangala to Jinja (UGX)		72,000
Insurance CPO at Jinja (UGX)	3,013	3,103

cont. table 4

Description	Basis	Costing
KOPGT management fees (UGX)	0%	
CPO price ex-POM, Kalangala (UGX)		2,523,098
Prices of FFB/t, developed at POM (UGX)		483,594
Price of FFB/kg delivered at POM (UGX)		484

Source: MAAIF/ VODP (2019)

Decisions regarding the setting of prices are made by two committees. Membership of the National Oil Palm Pricing committee includes representatives from the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) acting as chair, trustees of KOPGT, Kalangala district local government, OPUL/BIDCO, farmers from KOPGT, Ministry of Finance Planning and Economic Development (MoFPED), Ministry of Trade, Industry and Cooperatives (MoTIC), with ad-hoc co-opted members as the committee decides. A sub-committee in Kalangala district was also established to increase farmer representation, and that meets every month to set prices for FFBs. Membership of this sub-committee includes representatives from Kalangala district local government with the District Commercial Officer as chair, OPUL/BIDCO, MAAIF/VODP, Ssese Oil Palm Growers Cooperative (SOPGCO) leadership and seven farmers, KOPGT, and other members of the SOPGCO board. The terms of reference for the committee are to determine FFB price using the pricing formula, communicate the price to the farmers, and to handle any other issues related to oil palm production including agronomy and fertiliser use. Table 5 shows the outcomes of applying the pricing formula for oil palm in Uganda based on Malaysian Oil Board prices between February 2016 and March 2020.

Table 5: Applying the Ugandan pricing formula to international oil palm prices

Years	Months	Palm oil prices (US\$/t)	FFB price (US\$)	% FFB price/palm oil price	FFB UGX prices	Milling constant cost US\$/t of FFB (J)	% Milling constant/palm oil price
2020	March	635.19	117.86	19%	436.08	102.49	16%
	Feb	728.81	135.80	19%	502.47	118.09	16%
	Jan	810.07	151.38	19%	560.10	131.63	16%
2019	Dec	763.73	142.50	19%	527.23	123.91	16%
	Nov	685.41	127.48	19%	471.69	110.86	16%
	Oct	591.35	109.46	19%	404.99	95.18	16%
	Sept	580.3	107.34	18%	397.15	93.34	16%
	Aug	586.12	108.45	19%	401.28	94.31	16%
	July	543.88	100.36	18%	371.32	87.27	16%
	June	552.19	101.95	18%	377.22	88.65	16%
	May	563.55	104.13	18%	385.27	90.55	16%
	April	588.45	108.90	19%	402.93	94.70	16%
	March	573.02	105.94	18%	391.99	92.12	16%
	Feb	602.97	111.68	19%	413.23	97.12	16%
	Jan	584.58	108.16	19%	400.19	94.05	16%
2018	Dec	535.02	98.66	18%	365.04	85.79	16%
	Nov	539.1	99.44	18%	367.93	86.47	16%
	Oct	589.8	109.16	19%	403.89	94.92	16%
	Sept	605.15	112.10	19%	414.77	97.48	16%
	Aug	614.75	113.94	19%	421.58	99.08	16%
	July	616.14	114.21	19%	422.57	99.31	16%
	June	656.5	121.94	19%	451.19	106.04	16%
	May	687.15	127.82	19%	472.93	111.15	16%

cont. table 5

Years	Months	Palm oil prices (US\$/t)	FFB price (US\$)	% FFB price/ palm oil price	FFB UGX prices	Milling constant cost US\$/t of FFB (J)	% Milling constant/ palm oil price
2017	April	701.18	130.51	19%	482.88	113.48	16%
	March	706.19	131.47	19%	486.43	114.32	16%
	Feb	709.44	132.09	19%	488.73	114.86	16%
	Jan	703.45	130.94	19%	484.49	113.86	16%
	Dec	679.17	126.29	19%	467.27	109.82	16%
	Nov	728.86	135.81	19%	502.51	118.10	16%
	Oct	746.79	139.25	19%	515.22	121.09	16%
	Sept	754.25	140.68	19%	520.51	122.33	16%
	Aug	717.95	133.72	19%	494.77	116.28	16%
	July	720.48	134.21	19%	496.56	116.70	16%
	June	735.14	137.02	19%	506.96	119.14	16%
	May	762.75	142.31	19%	526.54	123.75	16%
2016	April	752.06	140.26	19%	518.96	121.96	16%
	March	778.7	145.37	19%	537.85	126.40	16%
	Feb	808.61	151.10	19%	559.06	131.39	16%
	Jan	825	154.24	19%	570.69	134.12	16%
	Dec	811.38	151.63	19%	561.03	131.85	16%
	Nov	766.93	143.11	19%	529.50	124.44	16%
	Oct	749.75	139.82	19%	517.32	121.58	16%
	Sept	797.85	149.04	19%	551.43	129.60	16%
	Aug	771.02	143.89	19%	532.40	125.12	16%
	July	678.16	126.09	19%	466.55	109.65	16%
	June	718.18	133.77	19%	494.93	116.32	16%
	May	753.42	140.52	19%	519.92	122.19	16%

Source: adapted from MPOB (2020) and MAAIF/ VODP (2019)

Assumptions

The pricing formula as applied in Uganda makes an accurate calculation of the price benchmarked on the current international market price, with few options for improving the amounts received by farmers for their produce. The exception is the milling constant (J) which incorporates processing efficiency and other costs imposed during milling, representing the mill's operation costs. In aggregate, milling costs were equivalent to 16% while the FFB price was 19% of the palm oil price on the international market. BIDCO and the government need to consider reducing milling technology costs marginally, to provide an improved cost for the farmers, though it is likely to be only a short to medium intervention. The largest component (62%) is ceded to the oil extraction rate, with a high value being extremely important in oil palm production, as well as to help minimise transport costs estimated at US\$20.20/t of FFB (MAAIF, 2019).

Trade-offs and loan repayments

Whereas the pricing approach may seem like the major challenge for farmers, their payment schedule also weighs heavy on many outgrowers. According to the VODP2/ MAAIF annual report 2017/18, farmers receive about 64% of the sales revenue, while 36% goes to repaying the loan capital and interest on the loan. In MAAIF's submission to parliament in 2017, an even higher percentage of 47% was indicated for loan repayments, i.e. of US\$700/ha from a possible total income of US\$1,500 without the loan (MAAIF/Parliament 2017).

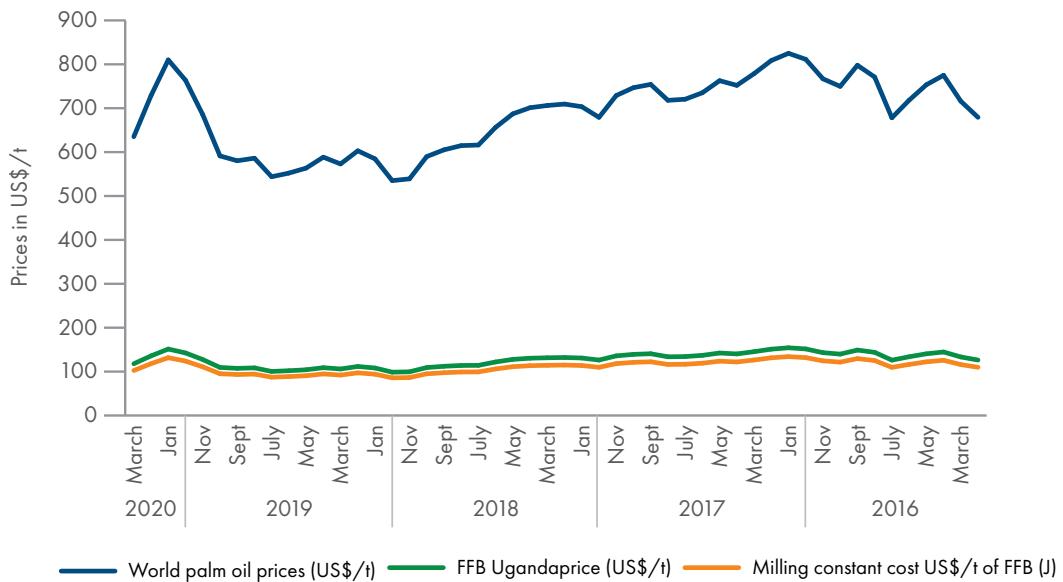


Figure 4: Trends in world palm oil prices compared to those in Uganda, 2016-2020. Source: adapted from MPOB (2020) and MAAIF/VODP (2019)

In addition, under the current system organised under the NOPP in Kalangala, farmers harvest FFBs and deliver them to collection points from where they are weighed in the presence of the harvesting clerk and the farmer or his representative. FFBs are then transported by KOPGT trucks to the mill where they are weighed on arrival, graded and recorded in the presence of the KOPGT representative stationed at the mill. KOPGT takes the records and confirms them with OPUL who then pay KOPGT for the FFBs received, KOPGT deducts loan repayments and transport costs, and deposits the balance in the farmers' own bank account. There are additional implications in the price related to quality, any rejected produce and transport costs that should however, be more transparent for farmers.

Table 6: Loan repayment schedule for smallholder oil palm farmers

Year	Month	Net sales from schedule (UGX)	33% loan recovery from FFB sales (UGX)	10% interest (UGX)	Aggregate payment (UGX)	Actual payment as a percentage of sales
2017	July	916,392,085	302,409,388	30,240,939	332,650,327	36%
	Aug	974,317,436	321,524,754	32,152,475	353,677,229	36%
	Sept	933,002,013	307,890,664	30,789,066	338,679,731	36%
	Oct	1,393,170,123	459,746,141	45,974,614	505,720,755	36%
	Nov	1,781,165,705	587,784,683	58,778,468	646,563,151	36%
	Dec	1,521,394,322	502,060,126	50,206,013	552,266,139	36%
2018	Jan	1,527,347,233	504,024,587	50,402,459	554,427,046	36%
	Feb	1,610,713,457	531,535,441	53,153,544	584,688,985	36%
	Mar	2,812,513,726	928,129,530	92,812,953	1,020,942,483	36%
	April	2,756,826,327	909,752,688	90,975,269	1,000,727,957	36%
	May	2,361,255,903	779,214,448	77,921,445	857,135,893	36%
	June	1,734,951,971	572,534,150	57,253,415	629,787,565	36%
Total		20,323,050,301	6,706,606,599	670,660,660	7,377,267,259	36%

Risks in using the pricing approach

The pricing approach linked to international market price appears the best option for farmers, offering transparency on aggregate revenues for FFBs that farmers receive, and that seems better when compared to pricing alternatives used by the government in Malaysia, the percentage of the market price given to farmers in Indonesia and Thailand. Where there are many independent smallholders selling to a domestic value chain full of small processors as in Ghana (Manley and Leynseelye, 2019), it is possible to have the price determined entirely by local buyers. In

the 2000s, the government in Ghana sought to transition from a largely domestic market to an export-oriented value chain. However, domestic prices were too high to compete favourably in the international market. Therefore, policy instruments were needed to control the high domestic prices (Kuwornu et al., 2009). For example, the cost of producing palm oil in Thailand is higher than in Indonesia or Malaysia, up to 10% more. This restricts the ability of Thai palm oil products to compete effectively in the export market, so 75% of crude palm oil from Thailand is consumed domestically (Krungsri, 2020).

A buyer-determined value chain has many disadvantages, but may be needed in the short term to provide incentives for the growth of a more domestic-oriented one, as long as domestic prices can be kept within an acceptable range, and the domestic market is willing to pay a higher price if a second value chain is allowed. The efficiency of Malaysian and Indonesian value chains is so high that Ghana and Nigeria, the leading African producers, are unable to compete in export markets, with Ghana's largest export market being Liberia (GEPA, 2019) where it supplies a 26.6% share, the rest imported from Malaysia. Given the high transport costs from Malaysia to Liberia, it shows that Ghana has not yet succeeded in being as cost-effective within its own value chain. A higher efficiency would be achieved through increased production and efficiency, and incentives may be needed in the medium term, as was the case in Thailand.

Impacts of price fluctuations

In Uganda, price fluctuations have already forced some farmers to set up artisanal mills to earn a better price from their FFBs, but MAAIF has highlighted challenges in artisanal processing, including a build-up of mill residues and other waste, and production of vegetable oil which is unsafe for human consumption risking the environment and people's health (MAAIF, 2015). When prices fall, smallholders reduce their effort, leading to lower yields and lower incomes that affects livelihoods but also lead to debt accumulation in the long term, that can go above the current average debt burden of between 36% and 47.

Oil palm production can improve the quality of life of smallholder farmers (Proforest, 2015), but rapid changes have also created challenges in ensuring environmental responsibility, safe working conditions and strong relationships across communities. Research on economic trajectories of oil palm showed medium to long term declines in economic welfare under the current system of oil palm production (Masiga et al., 2019). Projections of gross margins from oil palm production and subsistence farm incomes showed that based on current prices, oil palm production will continue to be the main source of income and economic returns in Kalangala district, assuming a stable price. For smallholders who rely on oil palm as their main source of income, the trade-off will be a loss in agricultural production and ecosystem services from forests, wetlands and water resources, in the absence of direct and specific interventions. Therefore, oil palm FFB prices need to be high enough to provide a viable livelihood, but at the same time prices should enable farmers to focus on improving productivity in existing plantations, maintaining remaining natural ecosystems, and supporting alternative livelihood options.

Many oil palm producing countries in Latin America, Southeast Asian and Africa are embracing the principles of the Roundtable on Sustainable Oil Palm (RSPO) that have developed a set of environmental and social criteria which companies must comply with in order to produce Certified Sustainable Palm Oil (CSPO). When they are properly applied, these criteria help to minimise negative impacts of palm oil cultivation on the environment and communities. RSPO principles will also be implemented under the NOPP, linked to the implementation of Environment Management and Mitigation Plans, with oversight from the government and NGOs.

Conclusions

Uganda's VODP and VODP2 projects achieved considerable success. Annual production of crude palm oil increased from 4,692 tonnes in 2010 to 37,363 tonnes in 2017. Smallholder farmers in Kalangala alone harvested 86,838 t of fresh fruit bunches (FFB) valued at UGX 39 billion (US\$10.4 million). In 2018, annual FFB harvests were 26,889 t, valued at UGX 15.7 billion (US\$4.2 million), produced by 1,074 outgrowers harvesting from 3,021 hectares. Much of the success is linked to the pricing approach, which is responsible to international price movements.

Based on project reporting, farmer earnings are about 50-60% of the ex-mill FFB price if transport costs and loan servicing costs are added. FFB prices were US\$85-130/t, but farmers' earnings were just US\$42-80/t of

FFB. Average annual farmer earnings was estimated at US\$1,771-3,375, above Uganda's targeted middle class income of \$1,025 per capita by 2020. However, smallholder oil palm farmers may have expected to reach the upper range of the lower middle class income of US\$4,035 (NPA, 2019) given the economic progress with oil palm.

The pricing approach used in Uganda is adequate for a standardised value chain comprising largely of supported smallholders, though the same can also be applied to independent smallholders if they are able to meet their farm inputs and transportation costs. A buyer-driven market would be possible if the oil palm strategy, currently under development, seeks to fast track the growth and expansion of local small scale processing and production across the country. Even where buyers determine prices, a national instrument is needed to ensure that they remain within the range of international market prices. The strategy for the domestic market is still to achieve export substitution, so palm and vegetable oil must be competitive against exports from more efficient exporting countries such as Malaysia and Indonesia.

There is also a need for transparent information on farmer loans and their impact on incomes from the sale of FFBs. Many farmers think that the payments they receive from KOPGT is the price of the FFBs, yet this includes deductions for transport and loan repayments. Therefore, in the same way that the pricing formula must be fixed independently, the loan repayment schedules should also carry the same transparency.

Finally, farmer organisations such as KOPGT should be encouraged to support price stability. A price curve can be negotiated with farmers that ensures that price peaks and price troughs are smoothed out throughout the year. The smoothed price curve is employed by agricultural cooperatives, which allow that farmers to receive consistent prices over the long-term, with agreement to share revenues or losses incurred from the price stabilization process. Government support to the price stabilisation scheme through regulation, and/or use of economic investment vehicles linked to securities, and/or financial market based operations can also help in stabilising oil palm prices.

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ANNEX: Roles and responsibilities of different actors within the NOPP

Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) – responsible for (i) overall supervision and direction to ensure that the project activities are within overall government programmes and strategy, (ii) participating in the selection and procurement of goods and services for the project, (iii) initiating policy on extension services and training to address the short term, medium term and long term needs of farmers, staff and processors, and (iv) monitoring extension activities to ensure that they are in line with unified extension strategies.

Ministry of Finance, Planning and Economic Development (MoFPED) – responsible for (i) disbursement of government counterpart funds, (ii) requisition of donor funds, (iii) replenishing special accounts, (v) effecting payments for goods and services. (vi) overseeing the utilization of the funds, investment planning and aid coordination, and (vii) review and approval of annual project work plans and budgets of the under MAAIF.

Implementing Agencies

Districts - The districts are responsible for: availing civil engineering services and overseeing the civil works funded by the project. Maintenance of district feeder roads, including those linking the farmers to the mills. Allotting land under long term lease for the oil palm development; avail production officers and extension officers to support the farmers towards the implementation of the project.

National Agricultural Research Organization (NARO) – responsible for (i) technical back-up on oil palm as a relatively new crop in Uganda, (ii); Assessing oil palm yields and yield potential of new hybrids under various conditions, (iii) developing simple manageable devices to control birds as well as approaches that will control pests and diseases; (iv) continuing plant introductions, screening of potential cultivars of essential oils; Conducting on station and on farm replication field assessment of selected cultivars of essential oils.

Uganda National Bureau of Standards (UNBS) – responsible for the (i) development of standards (raw material, products and by products), (ii) testing various products, (iii) Training oil producers on implementation of standards and quality assurance. Training millers/ram press owners in simple ways of testing their oil. Provide relevant information on standardization.

Vegetable Oil Development Council (VODC) – ensures that project activities are implemented in accordance with government policy, conditions in the loan documents are adhered to, and project financing complies with the government financial regulations. The VODC is also responsible for approval of annual work plans and budgets, and provides a forum for discussing all issues on project implementation and the development of the vegetable oil sector.

Project Coordination Office – managed by the Project Coordinator, this is responsible for day to day project activities, including the (i) preparation of work plans and budgets, (ii) submission of requests for funds, (iii) maintenance of adequate project financial records (iv) supervision, monitoring and evaluation of project activities, including those undertaken by other implementing agencies.

Farmers – provide land, prepare land, plant seeds, maintain the gardens, apply fertilizers, harvest the crop and transport their produce to the mill or market.

Kalangala Oil palm Growers Trust (KOPGT) – responsible for (i) representing the interests of palm oil producers, (ii) facilitating the identification/acquisition and surveying of farmers plots, (iii) carrying out periodic reconciliation of grower's accounts with OPUL, (iv) arranging transport of 'FFBs from farmers' plantations to mills; (v) arranging credit so farmers can buy fertilizers, seedlings and other inputs, and (vi) providing extension services to smallholders.

District field extension workers and KOPGT field officers – responsible for (i) facilitating trials in new crop varieties, (ii) carrying out demonstrations on planting, fertilizer application, harvesting and post-harvest handling, (iii) distribution of inputs, (iv) mobilising farmers to form groups, and (v) provision of feedback on operation and maintenance of processing equipment.

Oil Palm Uganda Limited (OPUL) – a limited company in charge of establishing the nucleus plantation, palm oil mill, setting up oil palm nurseries, and providing markets for FFBs.



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