



Palm Oil: The leading edible oil

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Improvement in consumption on the back of expansion in population

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Palm oil is an edible vegetable oil derived from the mesocarp of the fruit of oil palms, primarily the African oil palm and to a lesser extent the American oil palm and the Maripa palm. It is a tropical tree crop which is mainly grown for the industrial production of vegetable oil, for optimal growth and production, the crop requires a high and year round rainfall with little or no dry season and stable high temperature. It is a typical estate crop which is being grown and harvested over a large uniform area of about 3,000 to 5,000 hectares; and around a central oil mill to allow rapid industrial handling after harvesting. The crop grows mainly in tropical lowlands below 400 meters altitude, the covering by a dense rainforest and dense dry temperature of below 18°C do not affect vegetative growth but it can reduce the crop yield. Soil fertility is less important than soil properties, though a less fertile soil can reduce the yield of the crop. Oil palm yield is not only being determined by vegetable growth and production, but also by the way pests and diseases that affect the crop can be controlled and eradicated. From the third year, oil palm produce fruits which grows in large, densely clustered area, the yield stabilises after about four to six years then production declines slowly from the twenty-first year onward. A matured oil palm produces clustered of fruits of approximately 20kg around fifteen times in a year, the high productivity of the crop made oil palm the most efficient of all oil plants with yield of an average of 3.69 tonnes per hectare (t/ha). Its yield is five times higher than that of soybean which is 0.77t/ha, four times higher than sunflowers (0.86t/ha) and three times higher than rapeseed – 1.33t/ha.

Global production stands at c.58.0mmt in 2013. Palm oil is a common cooking ingredient in the tropical belts of Africa, South-east Asia and part of Brazil. Its uses in the commercial food industry in other parts of the world is also widespread because of its lower cost relative to other vegetable oil. According to the United States Department of Agriculture (USDA), oil palm is currently the most important vegetable oil in the world, accounting for c.43.0% of global supply of vegetable oil compared with soybean oil which represents c.23.2% in 2013. Also, about 57.0% of global export of vegetable oil is accounted for by palm oil in the same period. In addition, among the ten major oil seeds, palm oil accounted for c.5.3% of global land use for cultivation of oil and fats plants, and it produced 31.3% of global oils and fat output in 2011. Its dominance in global market is expected to continue because of the advantages it offers compare to the sources of other edible oil. Moreover, it becomes indispensable because it produces two different types of chemical oils which is an addition to the multiple uses it could be put into. On a global basis, the value of oil palm industry amounted to about US\$50billion.

In 2013, global production grew by c.7.8% to c.56.5 million metric tonnes (mmt) from 52.4mmt in the previous year. Indonesia and Malaysia accounted for c.85% of global production in 2013, while West African countries accounted for c.3.5%; other major producers of palm oil are Thailand, Columbia and Nigeria. Furthermore, production level of 60.8mmt and 63.3mmt were projected for 2015 and 2016 harvest season; the increase is attributable to a rise in demand for food products, chemical and bio-diesel industries. Palm oil is being used mainly in the production of margarine, soap, baked goods, convenience foods, and confectioneries. About 50% of packaged foods and cosmetics use palm oil as input. In addition, rising income level in Asian countries also add to the demand of packaged foods with high content of palm oil. Oil palm originated from West Africa; Cote d'Ivoire, Ghana, Nigeria and Sierra Leone were major producers of palm oil and palm kernel and it was the economic mainstay of some West African nations in the past. For example, in Nigeria palm oil industry employed millions of workers, while in Guinea, Liberia and Sierra Leone it was a major source of income and it constituted one of the largest trade along the common border districts of the countries. Also, it was the major export and mainstay of the economy of Cote d'Ivoire before cocoa took over in the 60s. However, the industry has suffered neglect over several decades, hence nations like Indonesia and Malaysia have taken over as the largest producer of palm oil in the world.

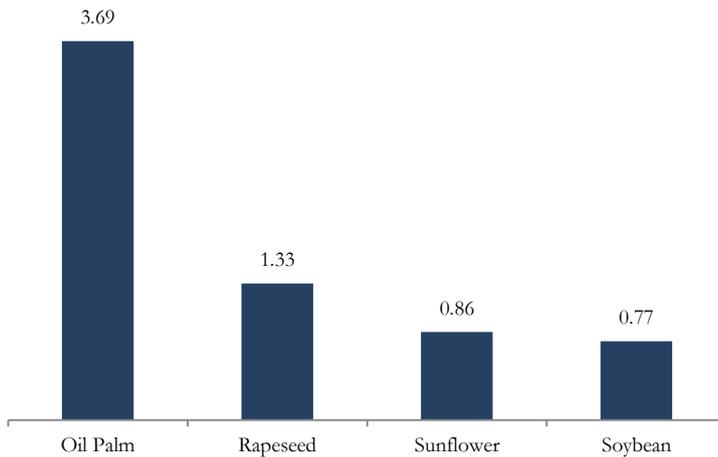
Furthermore, the population of West Africa would require about 2.0mmt of crude palm oil (CPO) to be self-sufficient, given a per capita edible oil consumption of 11kg. However, supply is currently c.1.4mmt per annum in the sub-region with a demand gap of c.600,000mt which is currently being satisfied by import. The global palm oil industry has recently witnessed unprecedented growth with a cumulative annual growth rate (CAGR) of 8.0%, although West Africa only recorded CAGR of 1.5% in the same period. The competitive landscape is dominated by South-east Asian nations who have better production efficiency – higher productivity at comparable costs of production – and ideal climatic condition, resulting in loss of revenue opportunity for producers in West Africa. Many countries in West Africa recently developed plans (and some are currently developing plans) to expand and develop oil plantations, on the back of strong international demand for vegetable oil and the large demand potential within Africa as well as demand from biofuel markets. As a result, several West Africa countries have formulated national programmes to encourage both domestic and foreign investments in new oil palm plantations.

The oil palm industry is characterised by various types of agro-systems, ranging from large agro-industry plantations to small-scale farmers, who may or may not be organised into cooperative schemes. Several supply models also co-exist, from fully-integrated agro-industry companies with oil mills which are

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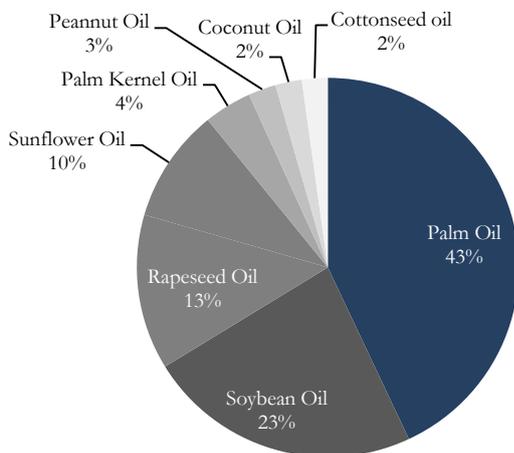
being procured from their own plantations, to out-grower schemes, and to small scale producers who either sell fruits to processors or produce oil for their own consumption or for sale to local markets. However, local markets are contending with a number of constraints such as little demand-driven research, limited access to cultivating land and finance, high production costs, low level of technology, low extraction rate, poor quality of CPO and inadequate government support.

Fig. 1: Average vegetable oil yield (tonnes per hectare per year)



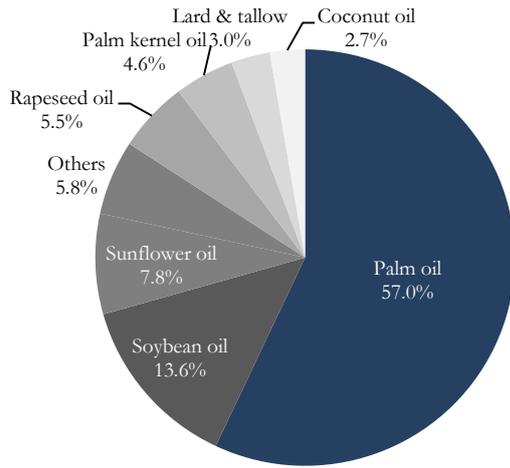
Source: Oil World, PAC Research

Fig. 2: World supply of edible oil in 2014



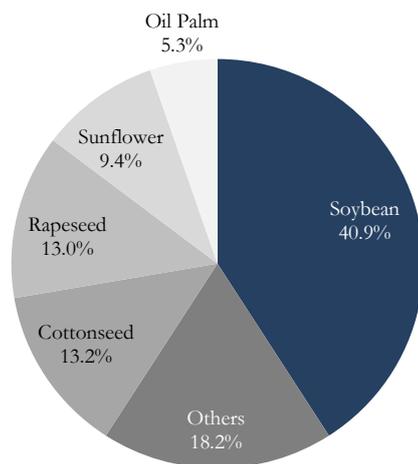
Source: USDA, PAC Research

Fig. 3: World export of edible oil in 2011



Source: Oil World, PAC Research

Fig. 4: Major oilseeds cultivation area in 2011



Source: Oil World, PAC Research

Indonesia tops the list of highest producers of palm oil. Historically, West African countries of Ghana, Nigeria, Cote d’Ivoire and Sierra Leone were the main producers of palm oil in the world; they accounted for more than half of global supply of the commodity in about six decades ago. However, the region had lost the dominant position of production and supply to the South-east Asian nations of Indonesia, Malaysia and Thailand. This was as a result of lack of major investments in the sector in West Africa, discovery of other commodities which replaced palm oil as main source of revenue for governments like cocoa in case of Ghana and Cote d’Ivoire, crude oil in case of Nigeria and diamond in Sierra Leone. Other factors that resulted into loss of competitiveness in the sub-region are lack of favourable climatic conditions, pervasiveness of pest and diseases and inability of farmers in West Africa to control or eradicate them and lack of adequate government assistance to farmers.

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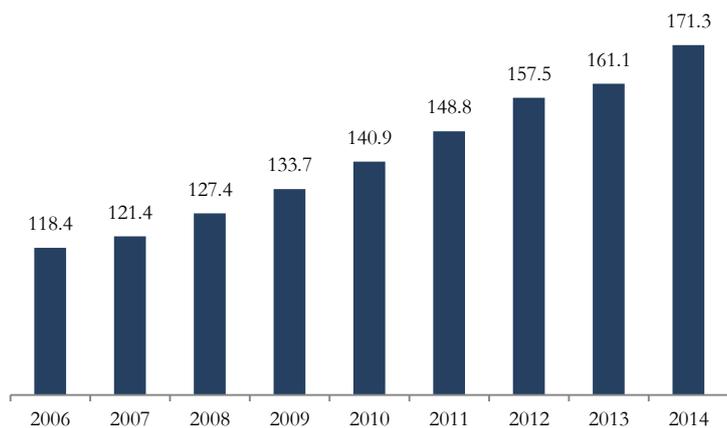
Global production and supply of palm oil has increased over the years with a CAGR of 8.0%; several factors that contributed to the increase in production among others are improvements in standard of living in developing countries of Asia and Africa. Other factors are increased industrial use of palm oil in developed countries, high production yield of the crop relative to other vegetable oil and the fact that two different forms of chemical oil – palm oil and palm kernel oil – can be derived from the crop. In 2013/14 production year, South-east Asian nations of Indonesia, Malaysia and Thailand produced 33.0mmt, 19.8mmt and 2.0mmt of palm oil respectively, which represented 53.7%, 32.3% and 3.3% of global production in the period. The three nations collectively accounted for 89.3% of global output in the period, while Nigeria produced 930,000mt which represented 1.5% of global production and total output in West Africa sub-region accounted for 3.5% of global output in the same period. However, environmental issues may restrict the production of palm oil in the future. Increasing production has led to deforestation in Indonesia which has resulted into environmental disaster in the country, and environmental activist are making the case a global issue the outcome of which may limit production capabilities of the country in the future.

Fig. 5: Palm oil production (mmt)



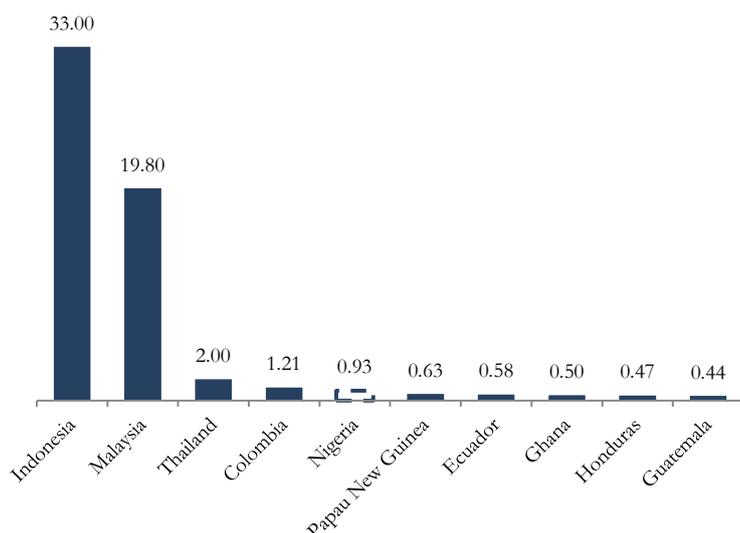
Source: Statista, PAC Research

Fig. 6: Production of vegetable oil (mmt)



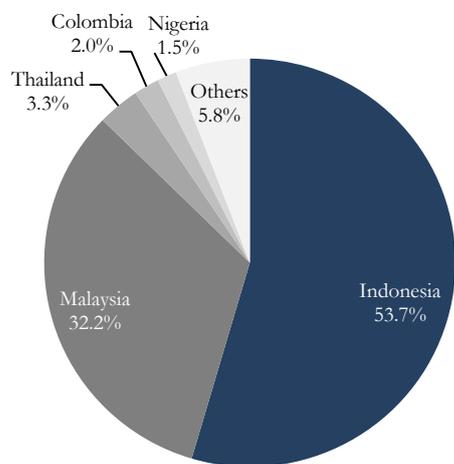
Source: Statista, PAC Research

Fig. 7: Top ten producers of palm oil in 2013/14 (mmt)



Source: Index Mundi, PAC Research

Fig. 8: Producers of palm oil in 2013/14



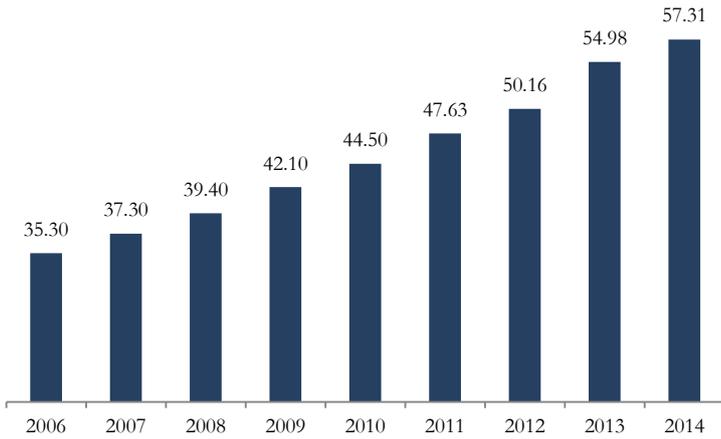
Source: Index Mundi, PAC Research

Indonesia leads the world in industrial consumption of palm oil. In the last few decades, the demand for edible oil has expanded greatly, especially the demand for palm oil witnessed prolific market expansion in the international vegetable oil and fats business. From a very low trade level in 1960s, palm oil is presently the highest produced and the mostly traded oil among all the vegetable oils. For example, between 1970 and 2010, the demand for palm oil has added c.2.50mmt per year and the trends is expected to continue for the next one decade, to satisfy demand for food requirements and biofuels. Global consumption of palm oil increased by 276.6% to 59.5mmt in 2013/14 compared with 15.8mmt in 1995/96. Furthermore, according to the FOA 2010/2019 agricultural forecast, global consumption of vegetable oil is expected to increase by c.30.0% between 2010 and 2019. The growth is expected to come from developing countries in view of expansion in population and rise in average income. Therefore, edible oil consumption is projected to grow in non-OECD countries by c.44.0% in the period. Moreover, consumption per capita in developing countries is four times less than in developed countries, for instance global consumption per capital of vegetable oil increased to 25.9kg in 2012 compared with 18.9kg in 2001. The EU-27 recorded consumption per capita of 59.6kg while the U.S. had 54.7kg in 2012, similarly Indonesia, China, India and Nigeria had 30.6kg, 24.6kg, 14.6kg and 12.5kg respectively. The entire West Africa sub-region had 11.0kg in the same period.

Indonesia is the largest consumer of both industrial and domestic palm oil in the world with total consumption of 15.1mmt in 2013/14 while India and the EU-27 came second with consumption of 9.4mmt each in the same period. However, Nigeria was the eight consuming nation with total consumption of 1.7mmt (i.e. industrial and domestic consumption of 280,000mt and 1.48mmt respectively). We are keen to highlight that the first ten largest consuming nations accounts for c.98.0% of global consumption and the demand is expected to increase in years ahead as a result of expansion in population, improvement in standard of living and relatively low prices of crude oil against the prices of other vegetable oils.

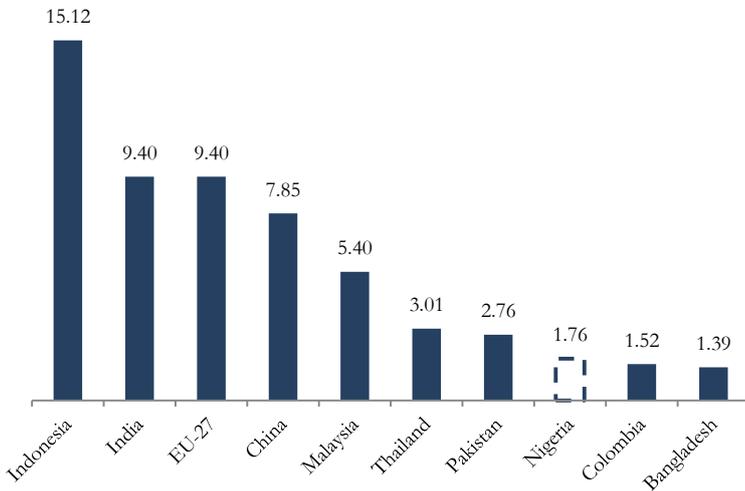
*Furthermore,
according to the
FOA 2010/2019
agricultural
forecast, global
consumption of
vegetable oil is
expected to increase
by c.30.0%
between 2010 and
2019.*

Fig. 9: Palm oil consumption (mmt)



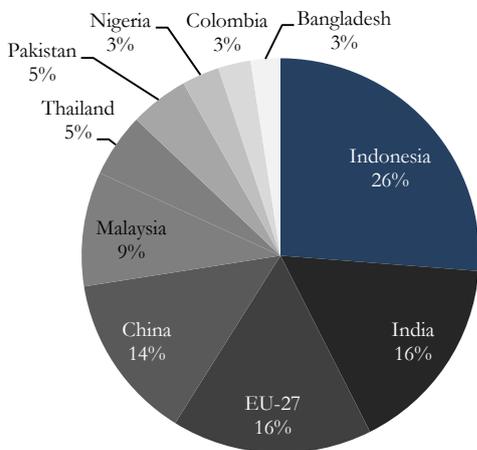
Source: Statista, PAC Research

Fig. 10: Leading consumers of palm oil in 2013/14 (mmt)



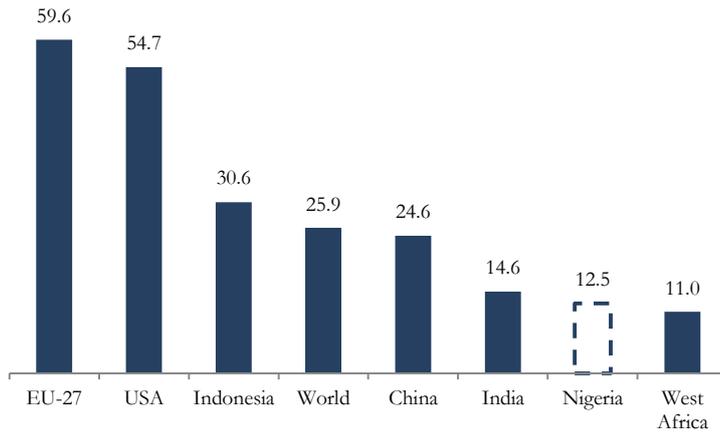
Source: Index Mundi, PAC Research

Fig. 11: Leading consumers of palm oil in 2013/14



Source: Index Mundi, PAC Research

Fig. 12: Vegetable oil – Par capita consumption in 2012 (kg)



Source: Oil World, PAC Research

Nigeria's oil palm industry – the journey thus far. From early 1950 till mid-1960s, Nigeria was the largest producer of crude palm oil in the world with average supply of 645,000mt representing c.43.0% of total global supply. However, Nigeria is currently the fifth producer of the commodity in the world with average output of 940,000mt per annum after Indonesia, Malaysia, Thailand and Colombia. Although, Nigeria's output represents c.55.0% of total production in Africa currently. The nation lost its leading position to Indonesia partly as a result of the civil war that destroyed oil palm plantation in the Eastern region then, the discovery of crude oil as the major source of foreign exchange which shifted attention away from agriculture and lack of significant investments in the industry from both the private and public sector over several decades are other factors that led to the declined fortune of the industry. Nigeria has approximately 24 million hectares of land that is ideal for cultivation of oil palm which spread across fifteen states in the country, i.e. Abia, Anambra, Bayelsa, Akwa Ibom, Cross River, Delta, Ebonyi, Ekiti, Enugu, Ondo, Ogun, Osun, Oyo, Imo and Rivers. However, about 3 million hectares of land is been cultivated currently and the total ideal plantation area in the South-south region of the country alone ranges between 1.4 million hectares to 1.7 million hectares.

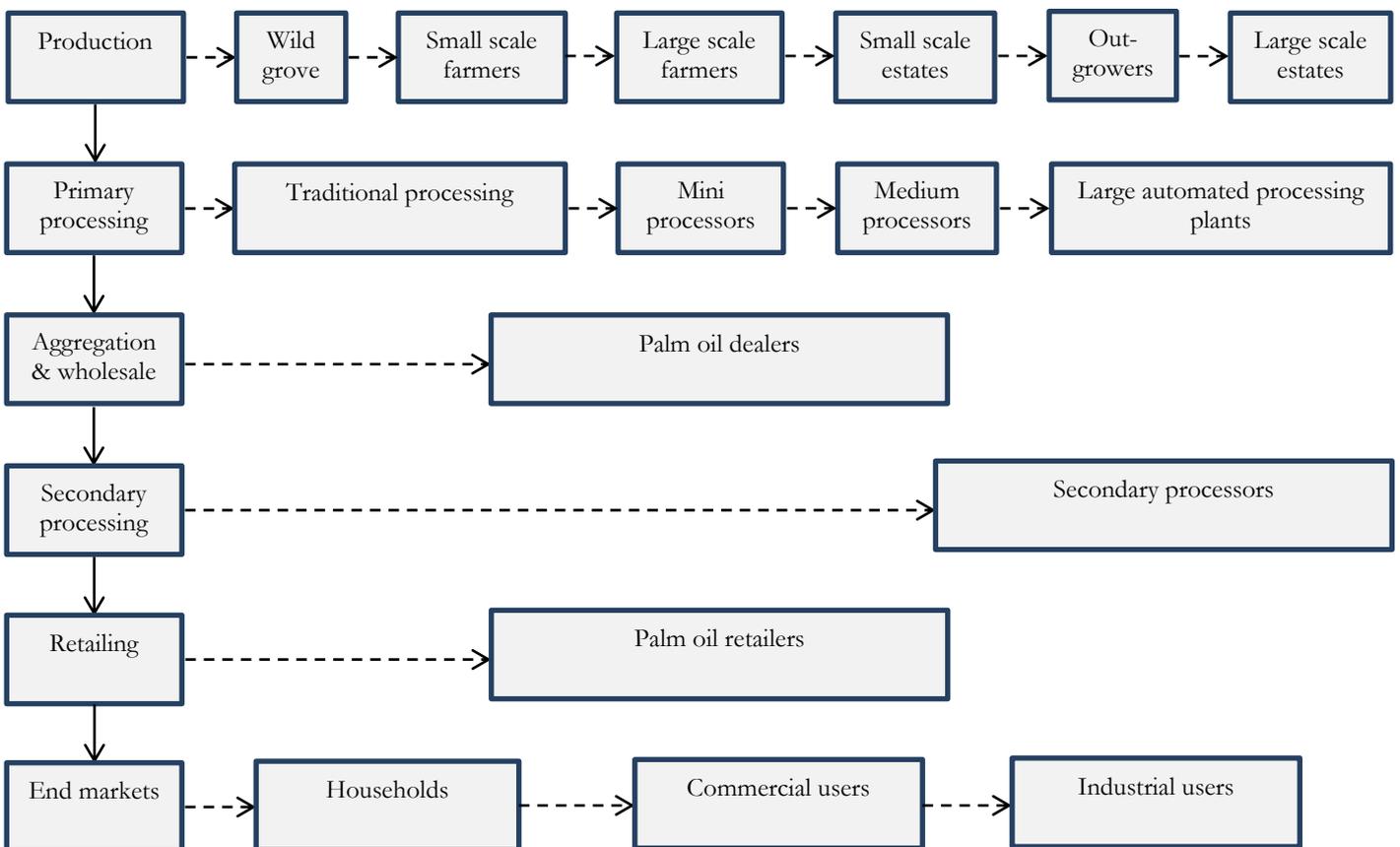
The nation is presently a net importer of palm oil as domestic production cannot meet the growing demand and the shortage of about 700,000mt is being filled with import from Cote d'Ivoire, Belgium, Japan and the USA. In addition, the Federal Government – during the tenure of the immediate past administration - included the plan for self-sufficiency in palm oil production in the Agricultural Transformation Agenda which was expected to be achieved by the year 2020. Palm oil is being used in Nigeria for food and non-food consumption, basically four types of palm oil products are being marketed in the country; 1.) Technical Palm Oil (TPO) which is being sold as unprocessed oil for traditional use and it is being essentially consumed by households.

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2.) The high quality palm oil called Special Palm Oil (SPO) which is being produced by large mills and used for industrial purpose. 3.) The Palm Kernel Oil (PKO) derived from the kernel of the fruit and also meant for industrial use. 4.) The Refined Bleached Deodorised Oil (RBD), refined oil from which colours and smells are being removed which is also meant for industrial use. The demand in the traditional market is three times higher than the industrial demand (food and non-food), due to lack of development of the industry for primary and secondary transformation. This implies that domestic household consumption is primarily a major determinant of supply deficit in Nigeria. The uses of palm oil for food consumption are as follows: Cooking oil, deep frying oil, margarines and spreads, bakery fats, cocoa butter alternatives fats, confectionery fats, ice cream fats, and infant nutrition fats. Non-food uses of palm oil are as follows: Cosmetics and personal care, soaps, candles, pharmaceuticals, lubrications and grease, surfactants, industrial chemicals, agrochemicals, coatings, paints and lacquers, electronics, leather and biodiesel.

Value Chain analysis and processing in Nigeria. Palm oil value chain is composed of a wide range of operators belonging to different channels depending on the production method and the type of oil concerned. The main functions in the chain are production, primary processing, secondary processing, wholesale and retailing.

Fig. 13: Value chain map for palm oil industry in Nigeria



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