



## **Business and Investment Opportunities in the Agribusiness Industry of Nigeria**

*Adefolake Adeyeye, PhD, Research Associate of NTU-SBF Centre for African Studies*

*31 August 2017*

## Contents

	<u>Page</u>
1. Nigeria in Context	3
2. Executive Summary	4
3. The Rice Sector in Nigeria	10
3.1 Local Rice Production	12
3.2 Rice Processing	14
4. Tomato Production and Processing	17
5. Eggs and Poultry	20
6. Fruit Juice Production	24
7. Cashew and Groundnuts (Mixed Nuts and Fruits)	27
8. Cassava Production in Nigeria	29
8.1 Cassava Production	29
8.2 Cassava Processing	31
9. Oil Palm Production in Nigeria	33
9.1 Oil Palm Production	35
9.2 Oil Palm Processing	36
10. Organic Agriculture and Fertilisers	38
11. Conclusion	40
Selected Biography	42

## Nigeria in Context

Nigeria is home to Africa's largest market with a population of more than 180 million. According to the World Population Prospects, 2017, published by the United Nations' Department of Economic and Social Affairs, Nigeria's population, currently the 7<sup>th</sup> largest in the world, is growing quite rapidly. As a result, Nigeria's population is projected to surpass the United States before 2050 to become the third largest country in the world.<sup>1</sup> PwC's report in February 2017 on the World in 2050 projects that Nigeria's world GDP ranking (on a purchasing power parity basis), which in 2016 was 22, could move up 8 places to 14 by 2050. To achieve this, Nigeria would need to diversify its economy and improve its governance standards and infrastructure.

The PwC report further states that Nigeria will have an average annual growth of around 2% till 2020, where after it will accelerate to an average growth of almost 4.5% per annum between 2041 and 2050.<sup>2</sup> Underpinning this future growth prospect, is Nigeria's large consumer market, strategic geographic location, and its young and entrepreneurial population. Economic diversification is also critical. The Nigerian government's focus on building an agribusiness economy is key to the economic diversification that will support this future growth. The government's vision for agribusiness is to deliver sustained prosperity by satisfying domestic food security concerns, generating exports and supporting sustainable income and job growth.<sup>3</sup>

This report will focus on agribusiness in Nigeria. It will consider Nigeria's Agriculture Promotion Policy 2016-2020, also known as the Green Alternative or APP. It will also consider the most recent statistics from the Food and Agriculture Organization of the United Nations on Nigeria's crop and livestock. It will look at specific opportunities and challenges in Nigeria's agribusiness industry in order to maximize potential benefits to future investors. The Federal Government's plan to boost the local production of agricultural food crops and livestock through the use of initiatives such as the Central Bank of Nigeria's Anchor Borrower Programme (ABP), creates varied opportunities for investment. The ABP aims to increase banks' financing to the agricultural sector, reduce agricultural commodity importation and conserve external reserves.<sup>4</sup>

Reasons to invest in Nigeria's agribusiness sector include the size of the Nigerian population, its GDP growth, the availability of its labour force and raw resources, and the potential for good returns. However, there are a number of limitations, such as land access constraints, low levels of irrigation, limited agricultural research integration, high cost of farm inputs, fertilizer availability and affordability, limited access to market, mechanisms to prevent waste and postharvest loss and inadequate processing facilities. The private sector investment can be guaranteed with government

---

<sup>1</sup> United Nations, Department of Economic and Social Affairs, Population Division (2017). *World Population Prospects: The 2017 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP/248.

<sup>2</sup> PwC, The World in 2050 – The long view: how will the global economic order change by 2050, <https://www.pwc.com/gx/en/world-2050/assets/pwc-the-world-in-2050-full-report-feb-2017.pdf>.

<sup>3</sup> Federal Ministry of Agriculture and Rural Development, The Green Alternative: Building on the successes of ATA, <http://fmard.gov.ng/the-green-alternative/>.

<sup>4</sup> Development Finance Department, Central Bank of Nigeria, Anchor Borrowers' Programme Guidelines, December 2016, <https://www.cbn.gov.ng/Out/2017/DFD/Anchor%20Borrowers%20Programme%20Guidelines%20DEC%20%202016.pdf>.

support through friendly, clear and consistent policies, regulations, laws and administrative practices.

## **Executive Summary**

Growth in the urban population of Africa can potentially lead to a US\$1 trillion regional market for African producers by 2030.<sup>5</sup> Agriculture and food processing are vital for creating this US\$1 trillion industry. Food processing is any intentional change in food occurring before consumption. Changing consumer demographics related to lifestyle changes, urbanization, and tourism is resulting in an increased demand for convenience and processed foods. However, Africa's agriculture and agribusiness industry is underperforming, providing opportunities for investors to benefit from this huge market.

This report seeks to provide investor friendly information on selected sectors of the agribusiness sector, particularly the local agricultural production and processed food industry in Nigeria. It uses desktop research to establish the size, opportunities and challenges for agriculture and food processing industry in Nigeria. The report has also considered the opinions of Singaporean businesses involved in the agribusiness sector in Nigeria where possible.

The demand for convenience and processed food is growing in Nigeria. This demand is led by Nigeria's expanding middle class, with consumer changes in tastes, patterns and style. Consumers are also becoming more health conscious, adding to the need for nutritious pre-packaged food. The food processing and packaging market report notes that Nigeria's packaging and food processing market is one of the largest in Africa, estimated at about US\$545 million.<sup>6</sup> Between 2010 and 2012, imports of food processing and packaging technology increased 39% from €198 million to €275 million. The packaging industry experienced growth of 12% between 2010 and 2015.<sup>7</sup>

The food processing and packaging market report also notes that the food and beverage industry accounts for 66% of total consumer expenditure, estimated at \$150 billion. It is the largest sector in manufacturing, accounting for 22.5% of the manufacturing industry. Small and medium enterprises account for 85% of companies, with 10% of total sales volume, while the big food and beverage players constitute 15% with 90% of sales. In the packaged food sector, 65% share of total revenue go to multinational firms who partner with local firms to repackage and market their products.<sup>8</sup> The packaged foods sector has seen an influx of new players and products, making it one of the most dynamic sectors in the industry. Improved product quality and innovation, advertising and direct distribution all contribute to the dynamism.

Nigeria's agriculture and agribusiness industry is plagued with numerous challenges. These challenges include business, infrastructure and regulatory problems. Business challenges include the lack of funds, low market share, cost of raw materials, taxation and other issues affecting the ease of doing business. There is inadequate infrastructure such as power supply, transportation

---

<sup>5</sup> World bank 2013, Unlocking Africa's Agricultural Potential, Africa Region Sustainable Development Series, <https://openknowledge.worldbank.org/handle/10986/16624>.

<sup>6</sup> Nigeria Manufacturing Expo 2017, Food Processing and Packaging Market Report, [http://www.nigeriamanufacturingexpo.com/uploads/Pages/site160\\_33588\\_en\\_file1.pdf](http://www.nigeriamanufacturingexpo.com/uploads/Pages/site160_33588_en_file1.pdf).

<sup>7</sup> Nigeria: How to promote Food Processing as mega-revenue Earning Industry, The Guardian, 22 January 2015.

<sup>8</sup> Ringier Food, Nigeria's food and beverage industry sustains robust growth, 29 January 2015, <http://www.industrysourcing.com/article/nigeria%E2%80%99s-food-and-beverage-industry-sustains-robust-growth>.

facilities and networks, storage facilities, which can lead to poor capacity for postharvest handling, and high production and productivity costs. Regulatory challenges, such as insufficient food inspection, lack of standards and/or enforcement, hinder food processing and quality.

Food quality and safety systems need to be revamped to ensure the health of consumers and the competitiveness of food exports. There is a need for more food testing facilities, strengthened inspectorate systems and better co-ordination between federal agencies. Lessons from initiatives, such as the 2013-2018 European Union (EU)-funded National Quality Infrastructure Project for Nigeria (NQIP), should be put to good use. The NQIP, implemented by the United Nations Industrial Development Organization, seeks to address challenges related to the quality of infrastructure, including providing trust for Nigerian products in regional and international markets, strengthening technical regulation and improving the enforcement of quality control of local and imported products.<sup>9</sup>

The National Agency for Food and Drug Administration and Control (NAFDAC) and the Standards Organisation of Nigeria (SON) are beneficiaries of the NQIP, increasing the potential for policies and programmes to be implemented for food safety and improved industry regulations. A tangible outcome of the NQIP is the preparation of the National Directory of Testing and Calibration Laboratories in Nigeria. The directory featured 78 laboratories with a strong presence in Lagos, Port Harcourt and Abuja. It hopes to eventually cover the whole country and become a web tool accessible to all interested stakeholders. With regards to testing for foods, the directory lists a number of private and public laboratories. For instance, the SON's directorate of laboratory services, which undergoes testing in its food technology laboratories in Lagos with sub-laboratories in microbiology, physio-chemical, micro-nutrients and mycotoxin, is involved in the testing of a number of food products listed in the directory.<sup>10</sup> The directory is therefore a useful tool for companies who want to confirm the integrity, quality and competitiveness of their products in Nigeria.

Agricultural research is also necessary. The government needs to engage its numerous institutions to ensure the conduct of valuable, quality and accessible research that will increase productivity across the agricultural value chain. Nigeria's National Agricultural Research system, made up of over 78 institutions and organisations, including research institutes, federal colleges of agriculture, agriculture facilities in universities and specialized agriculture universities, need to increase efforts to engineer sustainable growth. Reasons cited for the failure to engineer growth, include weak mechanisms for translating research into field usage and an inability to incentivize innovation. The private sector can help these institutions by more effectively collaborating with them in areas such as funding, professorships/chairs, scholarships and awards.

Despite the challenges, there is tremendous untapped potential in Nigeria's agriculture and agribusiness sector. In Quarter 3 of 2016, the sector grew 4.88% and has grown by as much as 13% in previous years. The Nigerian government is prioritizing agriculture with growth plans of 6.9% from 2017-2020. Rice, cashew nuts, groundnuts, cassava and vegetable oil are products the country hopes to export by 2020. There are plans to make Nigeria self-sufficient in tomato, rice

---

<sup>9</sup> Building Trust for Trade, NQIP Brochure, <https://www.nqi-nigeria.org/home/48>.

<sup>10</sup> NQIP, Directory of Testing and Calibration Directories in Nigeria, <https://labsapi.nqi-nigeria.org/docs/Directory%20of%20Testing%20and%20Calibration%20Laboratories%20in%20Nigeria%20v1.pdf>.

and wheat by 2017, 2018 and 2019/2020 respectively.<sup>11</sup> These goals will involve significant private sector investment and government collaboration and support.

A broad range of food production and processing opportunities can be gleaned from the Green Alternative. The document provides the following table with 2016 estimates in Demand and Supply gaps across key crops and activities in Nigeria.

*Table 3: Gaps in Nigeria Demand and Supply Across Key Crops and Activities (2016 Estimate)*

Crop	Demand (tons)	Supply (tons)	Observations
Rice	6.3 million	2.3 million	Insufficient supply chain integration remains issue
Wheat	4.7 million	0.06 million	Driven by demand for various types of wheat (white, hard, durum), etc. for bread, biscuits and semovita
Maize/Corn	7.5 million	7.0 million	Limited imports required but can shift due to feed demand
Soya Beans	0.75 million	0.6 million	Animal feed and protein cost alt. driving demand
Chickens	200 million birds	140 million	Gap filled by illegal imports that enter market at lower price point than domestic producers; gap also a moving target based on fast food/QSR demand
Fish	2.7 million	0.8 million	Fall off in ocean catch and weakness in aquaculture yields due to cost of fish feed a constraint on growth
Milk / Dairy	2.0 million	0.6 million	Driven by insufficient milking cows and low yields (~15-25 liters/day versus norm of 35 – 40 liters NZ/US)
Tomato	2.2 million	0.8 million	Actual production is 1.5 million tons but 0.7M ton is lost post-harvest
Yams	39 million	37 million	Limited gap today but volumes expected to rise in planning period
Oil Palm	8.0 million	4.5 million	Refers to fresh fruit bunch (FFB) from which oil is extracted at a 10% - 15% efficiency rate
Cocoa	3.6 million	0.25 million	Demand is global demand which will rise to 4.5M by 2020
Cotton	0.7 million	0.2 million	Demand is for seed cotton and could rise to 1.0 – 1.5 million tons subject to textile sector revival
Sorghum	7.0 million	6.2 million	Demand will rise further as use in feed grows in 2016 – 2020. Import of malt extracts and glucose syrup is currently used to manage gap, hence a commercial threat for Nigerian farmers

Source: [www.FMARD.gov.ng](http://www.FMARD.gov.ng)

The report will focus on the production and processing of nine core agriculture products. This will include four key crops on the Green Alternative list above - rice, tomato, chicken (poultry) and oil palm, as well as five other products - chicken eggs, fruit juice, mixed nuts (cashew and peanuts), cassava and organic fertilizers. The depth of research needed to cover all key crops listed in the green alternative necessitated a selection of key crops to be addressed.

<sup>11</sup> Federal Ministry of Budget and National Planning, Nigeria Economic Recovery and Growth Plan, 2017-2020, <http://www.nationalplanning.gov.ng/index.php/news-media/news/current-news/780-federal-republic-of-nigeria-economic-recovery-growth-plan-2017-2020>.

Statistics from the Food and Agriculture Organization of the United Nations (FAO) on Nigeria's 2014 production, yield and area harvested for rice, tomato, fruit, cashew and groundnuts, as well as chicken stocks, show Nigeria's performance in the given year.

		2014		
		Unit	Value	Flag Description
[-] Area harvested	Cashew nuts, with shell	ha	380.744,00	FAO data based on imputation methodology
	Fruit, fresh nes	ha	185.118,00	FAO data based on imputation methodology
	Groundnuts, with shell	ha	2.770.100,00	Official data
	Rice, paddy	ha	3.095.800,00	Official data
	Tomatoes	ha	541.800,00	Official data
[-] Production	Cashew nuts, with shell	tonnes	894.368,00	FAO data based on imputation methodology
	Fruit, fresh nes	tonnes	1.255.902,00	FAO data based on imputation methodology
	Groundnuts, with shell	tonnes	3.413.100,00	Official data
	Rice, paddy	tonnes	6.734.000,00	Official data
	Tomatoes	tonnes	2.143.500,00	Official data
[-] Yield	Cashew nuts, with shell	hg/ha	23.490,00	Calculated data
	Fruit, fresh nes	hg/ha	67.843,00	Calculated data
	Groundnuts, with shell	hg/ha	12.321,00	Calculated data
	Rice, paddy	hg/ha	21.752,00	Calculated data
	Tomatoes	hg/ha	39.563,00	Calculated data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

		2014		
		Unit	Value	Flag Description
<b>Stocks</b>	<b>Chickens</b>	1000 Head	144,952	Official data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

		2014		
		Unit	Value	Flag Description
[-] Area harvested	Cassava	ha	7,102,300	Official data
	Oil, palm fruit	ha	3,031,661	FAO data based on imputation methodology
[-] Production	Cassava	tonnes	54,831,600	Official data
	Oil, palm fruit	tonnes	7,962,213	FAO data based on imputation methodology
[-] Yield	Cassava	hg/ha	77,203	Calculated data
	Oil, palm fruit	hg/ha	26,264	Calculated data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

Comparing selective sections of Nigeria's 2014 agriculture performance with the statistics given for West Africa below, Nigeria's opportunities and capabilities in agriculture arguably are evident. For instance, Nigeria produced 2.1 million tonnes of tomatoes of the 3.5 million tonnes aggregate production for West Africa.

		2014			
		Unit	Value	Flag Description	
Western Africa	Area harvested	Cashew nuts, with shell	ha	2,940,447	Aggregate, may include official, semi-official, estimated or calculated data
		Fruit, fresh nes	ha	335,014	Aggregate, may include official, semi-official, estimated or calculated data
		Groundnuts, with shell	ha	6,207,414	Aggregate, may include official, semi-official, estimated or calculated data
		Rice, paddy	ha	7,809,039	Aggregate, may include official, semi-official, estimated or calculated data
		Tomatoes	ha	667,288	Aggregate, may include official, semi-official, estimated or calculated data
	Production	Cashew nuts, with shell	tonnes	2,020,604	Aggregate, may include official, semi-official, estimated or calculated data
		Fruit, fresh nes	tonnes	2,035,561	Aggregate, may include official, semi-official, estimated or calculated data
		Groundnuts, with shell	tonnes	6,572,255	Aggregate, may include official, semi-official, estimated or calculated data
		Rice, paddy	tonnes	16,791,781	Aggregate, may include official, semi-official, estimated or calculated data
		Tomatoes	tonnes	3,528,369	Aggregate, may include official, semi-official, estimated or calculated data
	Yield	Cashew nuts, with shell	hg/ha	6,872	Calculated data
		Fruit, fresh nes	hg/ha	60,760	Calculated data
		Groundnuts, with shell	hg/ha	10,588	Calculated data
		Rice, paddy	hg/ha	21,503	Calculated data
		Tomatoes	hg/ha	52,876	Calculated data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

The Green Alternative, FAO statistics and regional comparisons highlight the opportunities prevalent in Nigeria's agribusiness sector. Focusing on the selected agricultural products in this report, there are investment opportunities for local production and strengthening processing capacities. This is more so considering the foreign exchange restrictions on the importation of rice, tomatoes, eggs, crude palm oil and poultry. The abundance of fruits, cashew and groundnuts, as well as the large consumer market, are also attractive for investors. Investors will be able to provide Nigeria with efficient productivity methods and value additions through processing, capable of taking Nigeria's agribusiness to higher levels of growth and profitability.

Rice production is insufficient to meet the demand, and although there are a number of key players involved in backward integration and processing, more investment is needed in areas including land area, improving rice yields, training for small farm holders, which make up more than 80% of farmers in the country, pre-milling and post milling operations. The government's plan to become self-sufficient as far as rice is concerned and ensuing initiatives to achieve this desire, should encourage private investment. Key players include the Olam Group, a Singapore global

agri-business, the Dangote Group and the Bua Group, which are Nigerian food and infrastructure companies.

Nigeria has the competitive advantage to lead worldwide tomato production. A major problem here is postharvest loss. A number of initiatives, such as the Bank of Industry and Central Bank of Nigeria funds and interventions, YieldWise, GEMS4, which is linking farmers to processors, and other private sector solutions, are making an impact. Investment opportunities in processing to make Nigeria self-sufficient in tomato paste and other tomato-based produce, are huge.

Chicken and egg production in Nigeria is set to grow to meet the increasing demand in protein-rich diets. The poultry sector is experiencing continued growth. However, there are investment opportunities in poultry equipment, breeding, feeding, milling and processing. The challenges caused by the high cost of poultry feed caused Olam to recently invest in animal feed mills, breeding farms, and a hatchery. Investments in the area of disease prevention, transport, logistics and processing are needed.

Opportunities for fruit production and processing go beyond the current key consumer preference flavours such as citrus, apple and mango. Investors may consider coconut, which can be processed into coconut water and coconut oil. The abundance of this fruit or nut in Nigeria and the potential local and global demand for its beneficial value, makes it investment worthy. Nigeria's fruit juice market, although maturing, has opportunities in the development of processing capacities. Inadequate production, postharvest loss and lack of processing capacities still seem to be reasons for Nigeria's continued importation of fruit juice concentrate. Dominant market players like Chi Ltd are looking towards expanding the local sourcing of raw materials. The Nigerian agribusiness, Teragro, is investing in fruit production and processing with the objective of reducing reliance on the importation of fruit concentrates.

Mixed nuts are gaining popularity in Nigeria's domestic market, as well as globally. Nigeria's comparative advantage in cashew and peanut production and the government's plan to make cashew a foreign exchange cash crop, require investments. The mixed fruit sector also needs value adding processing capacities. Singapore companies may be interested in processing as Nigeria already exports some of its processed cashew to Singapore and other neighbouring Asian countries. The volume of cashew processed in Nigeria is minimal, with most of the produce being shipped to Vietnam, India and other intermediary countries for shelling, processing and packaging.

Cassava production and processing provide huge investment opportunities across the cassava value chain. Nigeria, the largest producer in cassava production, needs investments to improve yield and the area cultivated. Such investments include the acquisition of land, use of mechanized equipment and efficient farming technologies. The Bill and Melinda Gates Foundation is involved in a project to ensure the availability of certified quality seeds that have the potential to greatly increase yields. Investments are also needed to transform the lucrative cassava processing sector. There is a huge unmet demand in the food sector for products such as high quality cassava flour (HQCF), food grade ethanol and starch, glucose and sweeteners. The use of HQCF for bread, if implemented successfully, will help reduce Nigeria's wheat importation and further increase demand for cassava processing. Successful implementation would also require investments. Industrial starch for use in the pharmaceutical, paper, textile and adhesive industry and ethanol for biofuel, also provide huge potential.

Oil palm production in Nigeria needs investment to meet an increasing demand driven by household and industrial consumption. Nigeria, the top producer and exporter of oil palm in the 60s, is now a net importer. With over 90% of crude palm oil carried out by smallholder farmers, there is room for investors to increase productivity. Okomu Oil and Presco, the largest commercial producers, account for just 7% of total crude palm oil production. This further highlights the need for more investments in the commercial production of oil palm. A number of companies, such as Dufil Prima Foods Plc and PZ Wilmar, are involved in backward integration with the potential to reap huge rewards.

Finally, Nigeria needs investments in the promotion and achievement of organic agriculture and fertilizer. Nigeria's agricultural system, which mainly consists of smallholder farmers, is ideal for organic farming. Investments targeting farmer education and training, technical knowhow, produce standards and organic fertilizer production would ensure participation in the \$80 billion global organic market and developing domestic market for organic fertilizer.

### **The Rice Sector in Nigeria**

Nigeria is the largest consumer of rice in Africa. Since the mid-70s, rice consumption has increased significantly at about 10% per annum due to changing consumer patterns.<sup>12</sup> According to the Green Alternative, the demand for rice is 6.3 million tonnes, while supply is just over 1/3 of demand at 2.3 million tonnes.

Over the years, domestic production has not been able to meet overall demand and/or the amount of rice supplied. For instance, in 2008, Nigeria produced about 2 million metric tonnes of milled rice, importing about 3 million metric tonnes.<sup>13</sup> In 2011, total production was 5.16 million tonnes, with 2.71 million tonnes produced locally and 2.45 million tonnes imported.<sup>14</sup> In February 2017, BBC News reported that Nigeria had imported 2.3 million tonnes of rice in 2016, with a demand of 5.2 million tonnes.<sup>15</sup>

The USDA Global Agricultural Information Network estimates Nigeria's annual rice per capita consumption at 40 kilograms. According to the Food Fortification Initiative, Nigeria's consumption of rice on average is 77 grams per capita per day (g/c/d). Urban consumption ranges between 66-69 g/c/d and rural consumption is 78-91 g/c/d. The urban consumers rely mainly on imported rice, whilst the rural consumers eat mostly domestically grown rice.

---

<sup>12</sup> Tunji AKande, An Overview of the Nigerian Rice Economy, <http://unep.ch/etu/etp/events/agriculture/nigeria.pdf>.

<sup>13</sup> Food and Agriculture Organization of the United Nations, Nigeria: Nigeria at a glance, <http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/>.

<sup>14</sup> Oluyemisi Kuku-Shittu and Angga Pradesha, paper presented at the 18<sup>th</sup> annual conference on Econometric Analysis and Policy Challenges in Africa, 24-26 July 2013, [http://www.aaawe.org/wp-content/uploads/2015/01/Yemisi\\_final.pdf](http://www.aaawe.org/wp-content/uploads/2015/01/Yemisi_final.pdf).

<sup>15</sup> BBC News, Why does Nigeria import so much rice, 2 February 2017, <http://www.bbc.com/news/world-africa-38795673>.

**Table 1: Demographics and annual rice availability**

Population <sup>1</sup>	Urban <sup>1</sup>	Available <sup>2</sup> (MMT)	Imports <sup>2</sup> (MMT)	Exports <sup>2</sup> (MMT)	G/c/d <sup>3</sup>	Production <sup>2</sup> (MMT)
181 million	48%	5.2	2.5	0	77	2.7
<i>2011-2016 trend<sup>3</sup></i>						
+2.45% per/yr <sup>1</sup>	+4.66% <sup>1</sup>	-1.38%	-7.6%	--	--	-0.6%

G/c/d: grams per capita per day; MMT, million metric tons

<sup>1</sup> CIA Factbook

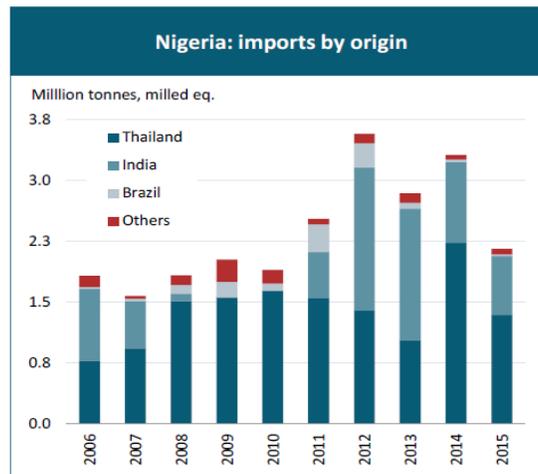
<sup>2</sup> FAO Food Balance Sheets, 2013

<sup>3</sup> USDA, 2016

Source: [http://ffinetwork.org/about/stay\\_informed/releases/images/Rice\\_Nigeria.pdf](http://ffinetwork.org/about/stay_informed/releases/images/Rice_Nigeria.pdf)

The Food Fortification Initiative also states that Nigeria has 4-5 large importers with an estimated share of 90% of official imports. The distinction between urban and rural consumers' preference for imported versus domestically grown rice may be changing due to the Central Bank restriction on dollars for importing rice.

From 2006 – 2015, most the rice imports into Nigeria came from Thailand and India.



Source: [www.fao.org](http://www.fao.org); Rice Market Monitor, 2016

Nigeria is said to have spent \$2.41 billion on rice importation between January 2012 and May 2015. According to VOA, ‘until 2015, Nigeria rice import was up to 4 million tonnes annually, much of which was smuggled from the western Benin Republic’.<sup>16</sup> The February 2017 BBC News report noted that nearly 17 million tonnes of rice was imported into Nigeria over the past 5 years. This was despite a 60% duty for imported rice and shipment of rice per day costing \$5 million.

The reality of the implications of a continued surge in rice importation led the Nigerian Central Bank to place restrictions on the allocation of dollars for rice imports in 2015. Along with rice, 40

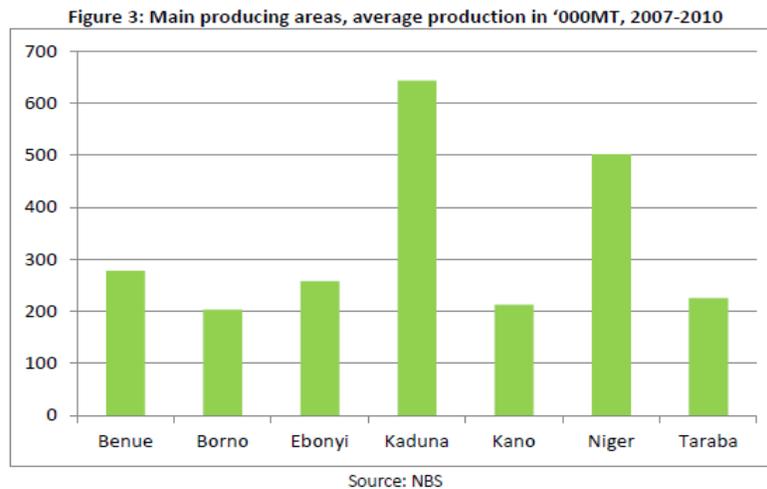
<sup>16</sup> VOA, Nigeria’s rice boom raises output but old problems exist, 9 March 2017, <http://www.voanews.com/a/nigerian-rice-boom-raises-output-but-old-problems-persist/3757129.html>.

other products, including tomato and tomato processing, meat and processed meat products, cannot be imported with foreign exchange sourced from the Nigerian foreign exchange markets.<sup>17</sup>

Although the figures for rice imports into Nigeria vary depending on the report, it appears rice importation has reduced as a result of the Central Bank’s restrictions. The FAO rice market monitor, April 2016, notes that Nigeria has cut rice imports by 35% to a 5-year low of 2.2 million tonnes.<sup>18</sup> The VOA also reports that smuggling has reduced to about 700,000 tonnes due to stricter border monitoring. The decision to include rice in the list of items with foreign exchange restrictions, also led to an increase in demand of locally produced rice.

### Local Rice Production

Nigeria is one of the largest producers of rice in Africa. A diverse range of rice varieties can be cultivated in all the geographical zones of Nigeria. Rice is cultivated in states including Anambra, Ebonyi, Enugu, Ekiti, Gombe, Kano, Kebbi, Nasarawa, Niger and Ogun. Between 2007 and 2010, Kaduna State was the largest producer of rice with over 600,000 metric tonnes. This was followed by Niger with 500,000 metric tonnes.



Source: FAO, <http://www.fao.org/3/a-at581e.pdf>

Although Nigeria produces a lot of rice, the country has not been able to meet the increase in demand for local production and still does not produce enough rice for exports to other parts of Africa. Nigeria still relies heavily on imports to satisfy rice demand. One possible reason for

<sup>17</sup> Central Bank of Nigeria, Letter: Inclusion of some imported goods and services on the list of items not valid for foreign exchange markets, 23 June 2015,

<http://nationalplanning.gov.ng/images/pub/ERGP%20document%20as%20printed.pdf>.

<sup>18</sup>[http://www.fao.org/fileadmin/templates/est/COMM\\_MARKETS\\_MONITORING/Rice/Images/RMM/RMM\\_APR\\_16.pdf](http://www.fao.org/fileadmin/templates/est/COMM_MARKETS_MONITORING/Rice/Images/RMM/RMM_APR_16.pdf).

Nigeria's inadequate production of rice has to do with the land area used for rice cultivation. According to a 2013 technical note by the Food and Agriculture Organization (FAO), rice cultivation in Nigeria occurs on approximately 3.7 million hectares of land or 10.6% of the 35 million hectares of land under cultivation. Nigeria's total arable land area is 70 million hectares.<sup>19</sup> AgroNigeria puts the area of land used for rice cultivation at about 2 million hectares, less than half of the potential 5 million hectares that can be used.<sup>20</sup>

Another contributing reason is the fluctuations in rice output and yields. In the 1980's, Nigeria had significant rice production with increased output and yields. However, in the 1990s, although rice cultivation appeared to have been extensive with an increased output, rice yields declined.<sup>21</sup>

---

<sup>19</sup> Food and Agriculture Organization of the United Nations, Monitoring African Food and Agricultural Policies – Analysis of Incentives and Disincentives for Rice in Nigeria, July 2013, <http://www.fao.org/3/a-at581e.pdf>.

<sup>20</sup> AgroNigeria, Rice farming: What You Need to Know, 10 January 2014, <https://agronigeria.com.ng/rice-farming-what-you-need-to-know/>.

<sup>21</sup> Tunji AKande, An Overview of the Nigerian Rice Economy, <http://unep.ch/etu/etp/events/agriculture/nigeria.pdf>.

Figure 1: Area Cultivated and Rice Output in Nigeria

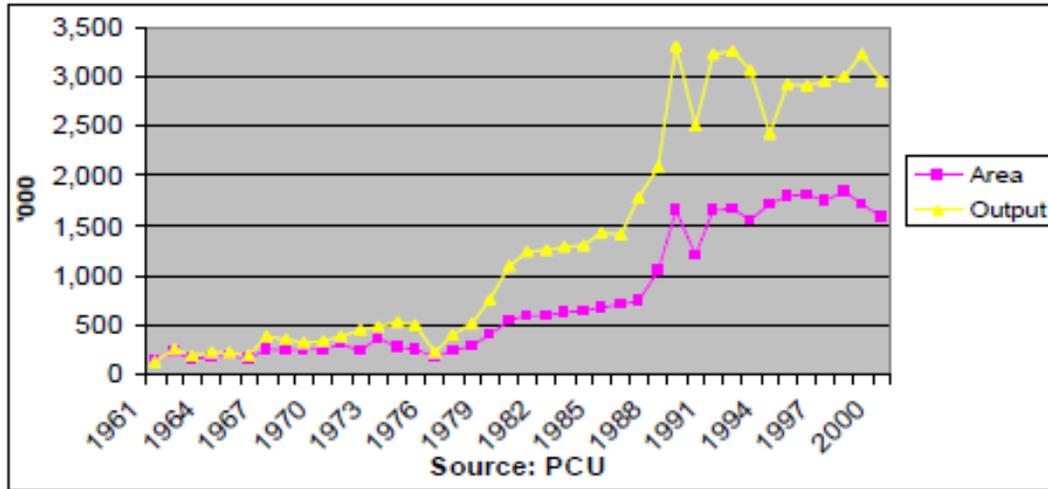
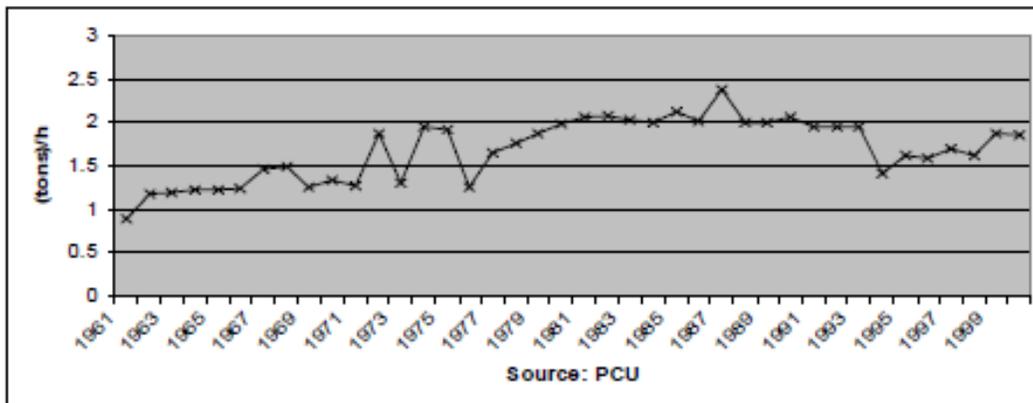


Figure 2: Yield of rice in Nigeria



Source: <http://unep.ch/etu/etp/events/agriculture/nigeria.pdf>

With Nigeria's Agriculture Transformation Agenda (ATA), which is promoting rice production, rice yields and output are increasing. In April 2017, Stallion Popular Farms and Mills Limited assured an annual increase in local rice production from 450,000 metric tonnes to 1.5 million metric tonnes, using an integrated rice value chain and enhanced milling activities.<sup>22</sup>

A third contributing factor is the scale at which the majority of rice farming occurs in Nigeria. Rice farming is dominated by smallholders and subsistence farmers who may lack the necessary finance, inputs and mechanization services to boost local production. To address this problem, the

<sup>22</sup> Fadekemi Ajakaiye, Stallion Farms lauds Buhari Agri-Business Agenda, Promises Increased Rice Yields, *This day*, 8 April 2017, <https://www.thisdaylive.com/index.php/2017/04/08/stallion-farms-lauds-buhari-agri-business-agenda-promises-increased-rice-yield/>.

government has made rice farming a priority and has increased efforts to boost the local production of rice by providing subsidized inputs and mechanization services to farmers. The government has also set up initiatives to provide finance and loans. Large scale farmers like Olam are also supporting small scale farmers. Such initiatives by the government and the private sector are making some impact, with the VOA reporting that the output of unmilled rice in 2016 was 7.85 million tonnes, compared with 4.54 million tonnes in 2010.

### **Rice Processing**

To ensure self-sufficiency in rice production and reduce the high cost of rice imports, the Nigerian government, under its Rice Transformation Project 2011-2014, encouraged private sector investors to establish integrated processing mills and enter into public private partnerships.<sup>23</sup> According to Agritrade, milled rice production in Nigeria in 2015 was estimated at 2.9 million tonnes, an increase of 1 million tonnes from the estimated 2014 figures.<sup>24</sup> The FAO's rice market monitor April 2016 estimate for 2016 was also 2.9 million tonnes.

Overall, the 2016 estimates for Nigerian supply of milled rice falls within 2.3 million tonnes and 2.9 million tonnes. This is because the Green Alternative puts supply at 2.3 million tonnes. As demand is estimated at between 6.3 million and 5.2 million metric tonnes, supply is clearly inadequate. There is therefore the ongoing need for investment in rice across the value chain. Many states, including Lagos, Ogun, Ebonyi, Anambra, Enugu, Cross river, Kogi, Plateau, Kwara, Benue, Nassarawa, Kebbi, Benue, Borno, Kaduna, Kano, Niger and Taraba, all promote investment opportunities in this sub-sector.

Areas for investment in rice processing include pre-milling and post-milling operations in areas such as winnowing paddy, drying, parboiling, destoning and packing. This will help improve the fragmented and low quality nature of the processing sub-sector. Investments are also needed in harvesting or mechanization, agronomic practices, post-harvest handling and outgrower schemes.

Under the administration of the former president, Goodluck Jonathan, 17 integrated large-scale rice processing plants were approved for establishment under the ATA. As at February 2015, Nigeria had 13 integrated rice mills compared to only 1 before the ATA was launched in 2011. Nigeria also had 4,350 small mills, which are growing at an annual rate of 40% and are seen as the major rice milling drivers.<sup>25</sup>

Well known Nigerian rice brands include Ebonyi, Ofada, Umza, Igemo, Olam, Anambra, Labana, Mama Happy and Lake Rice. These rice brands are produced in a number of mills operated by big rice players. In 2014, Olam set up a multi-dollar integrated rice mill in Nasarawa state, North-Central Nigeria, with the capacity to produce 36,000 metric tonnes of milled rice per annum. Olam

---

<sup>23</sup> UNAAB, Rice transformation proposal,  
<https://www.unaab.edu.ng/attachments/Current%20Rice%20Proposal.pdf>.

<sup>24</sup> Agritrade, Rice Value chain/Nigeria: Olam boosts Nigeria's rice supply with local brand, 20 April 2015  
<http://agritrade.cta.int/Agriculture/Commodities/Rice/Rice-value-chain-Nigeria-Olam-boosts-Nigeria-s-rice-supply-with-local-brand>.

<sup>25</sup> Crusoe Osagie, Local Farmers to Add 2.9m metric tonnes to Nigeria's rice stock, 24 February 2015,  
<http://allafrica.com/stories/201502241138.html>.

has one of the largest rice farms in Nigeria. The company also plans to increase its rice farming from 4,300 hectares to 6,000 hectares in a few years.<sup>26</sup>

The Bua Group owns Nigeria's largest rice mill. The group's rice mill in Kano currently has a 200,000 ton milling capacity. There are plans to increase capacity to 1 million tonnes within the next 4 years. The group hopes to reduce Nigeria's dependence on rice imports by boosting the local capacity to produce, process and package rice.<sup>27</sup>

Ebony Agro Industries Ltd and Tara Agro Industries Ltd are related companies involved in rice production. Ebony Agro Industries are the producers of Ebony Super and Ebony Gold Nigerian rice brands. The Tara Agro Rice mill is located in Enugu. It has the capacity to produce 42,000 metric tonnes of milled rice per annum. Ebony Agro mill is in Ebonyi. The mill has the capacity to produce 30,000 metric tonnes of milled rice per annum.<sup>28</sup>

Labana Global Ventures Ltd have 2 rice mills in Kebbi, with the capacity to process 16 tonnes of rice per hour. Stine Industries Ltd in Nigeria has a production capacity of 440 tonnes per day or 500,000 kilos per day.<sup>29</sup>

The Dangote Group also has large scale plans for rice in Nigeria. In 2014, the group pledged to invest over \$1 billion in commercial rice farming. In 2017, the group announced the launch of a 25,000 hectares rice outgrower scheme in Sokoto State, North-West Nigeria. There are plans to introduce 225,000 metric tonnes of parboiled, milled white rice by the end of 2017. If this is accomplished, the Dangote group may be able to provide about 4% of the Nigerian market demand within 1 year. The group also hopes to increase production to 1 million metric tonnes of milled rice to satisfy 16% of the domestic market demand for rice over the next 5 years.<sup>30</sup>

Wacot Rice, which is part of the TGI group, was set to open a rice mill in April 2017 with an annual capacity of 100,000 tonnes. Wacot Rice plans to work with rice farmers on 15,000 hectares and expand to 165,000 hectares in 10 years. The group engages with farmers via its training schemes, namely Good Agricultural Practices and Yield Enhancement Techniques.<sup>31</sup>

The Stallion Group is also involved in backward integration into rice milling and farming in Nigeria. From 2015-2016, it planned to expand rice production capabilities in Nigeria with investments of \$300 million. With the investments, Stallion sought to increase rice milling capacities from 430,000 tonnes per annum to 1.5 million tonnes per annum. The status of this project is unclear as the GrowAfrica portal lists the project as incomplete.<sup>32</sup> Another project listed

---

<sup>26</sup> Olam breaks ground on Nigeria's largest integrated animal feed mill, poultry breeding farms and hatchery in Kaduna State, 8 April 2016, <http://olamgroup.com/news/olam-breaks-ground-nigerias-largest-integrated-animal-feed-mill-poultry-breeding-farms-hatchery-kaduna-state/#sthash.mjiLcC4R.dpbs>.

<sup>27</sup> Femi Adegoya, BUA upgrades rice mill to meet one million tonnes processing target, *The Guardian*, 8 February 2017, <https://guardian.ng/business-services/bua-upgrades-rice-mill-to-meet-one-million-tonnes-processing-target/>.

<sup>28</sup> Nigeria: As 1.5 billion Tara rice Mills comes on Board, *The Guardian*, 10 January 2015, <http://allafrica.com/stories/201501120358.html>.

<sup>29</sup> NAN, Rice Mills employs 3,000 workers in Kebbi, *The Guardian*, 16 March 2016, <https://guardian.ng/news/rice-mills-employs-3000-workers-in-kebbi/>.

<sup>30</sup> Nigeria: Dangote Group Invest heavily in Rice Production, *Africa News*, 15 February 2017, <http://www.africanews.com/2017/02/15/nigeria-dangote-group-invest-heavily-in-rice-production/>.

<sup>31</sup> Solomon Elusoji, The March Towards Rice Self-Sufficiency, 14 March 2017, <https://www.thisdaylive.com/index.php/2017/03/14/the-march-towards-rice-self-sufficiency/>.

<sup>32</sup> Grow Africa, Stallion Nigeria Limited- Nigeria.

as incomplete on the GrowAfrica portal is the Umza International Farms Limited. From 2012-2016, the company planned to contribute to developing commercial scale rice cultivation and processing by investing \$27.125 million.

This quick review of some of Nigeria's large rice production players suggests that current supply is still inadequate. There is room for more investors who could contribute to domestic supply and possibly consider exports to neighbouring African countries. To truly make Nigeria self-sufficient in rice, investors should consider developing the processing capacities providing adequate technology, storage facilities and supply of domestic rice with high quality, low cost and attractive packaging.

### **Tomato Production and Processing**

Nigeria is the second largest producer of tomatoes in Africa and the thirteen largest in the world. The country produces 1.7 million tonnes of tomato annually at an average of 25-30 tonnes per hectare.<sup>33</sup> The Green Alternative puts Nigeria's 2016 production estimates at 1.5 million with 0.7 million tonnes lost post-harvest. However, demand estimates for tomato was 2.2 million tonnes. Nigeria's production is therefore insufficient for demand. This gap can easily be covered as Nigeria has the comparative advantage and potential to lead the world in tomato production and exports.

In 2015, along with rice, tomatoes and tomato paste were listed in the 41 items barred from access to foreign exchange at the Nigerian foreign exchange markets. Up until then, Nigeria's tomato paste market, estimated at \$1.5 billion, solely relied on imports.<sup>34</sup> With the restrictions, it has become difficult for companies to import tomato concentrate into Nigeria. Triple tomato concentrate, a major raw material in the production of tomato paste, is not produced in Nigeria, leaving a vacuum of 150,000 metric tonnes in the market.<sup>35</sup>

Similar to local rice production, which has since increased due to foreign exchange restrictions, local tomato production is on the rise. The Ministry of Agriculture and Rural Development, the Central Bank of Nigeria, the private sector and commercial banks are all involved in a private sector-led N600 billion (approximately US\$1.64 billion) programme to push tomato self-sufficiency by 2020. State governments are urged to provide land to potential farmers. Across the value chain, there are huge opportunities for investors.

Tomato cultivation in Nigeria mostly occurs in the northern part of Nigeria because of its favourable climate. Kaduna is Nigeria's largest tomato-producing state.<sup>36</sup> In 2013, Kano had the top spot with dry season cultivation of over 30,000 hectares of irrigated tomatoes.<sup>37</sup> Jigawa,

---

<sup>33</sup> Eromosele Abiodun, Foreign Exchange Restrictions – Manufacturers Decry Scarcity of Raw Materials, *This Day Live*, 11 January 2016, <http://www.nigeriamanufacturingexpo.com/This-Day-Live-Foreign-Exchange-Restrictions-Manufacturers-Decry-Scarcity-of-Raw-Materials>.

<sup>34</sup> Invest in Nigeria, Bank of Industry Trains Youth on Tomato Processing, 15 March 2017 <http://www.invest-nigeria.com/bank-industry-trains-youths-tomato-processing/>.

<sup>35</sup> Akin George, CBN Forex Restrictions – Relevance, Importance, *Daily Independent*, 20 July 2015, <http://independent.ng/cbn-forex-restrictions-relevance-implications/>.

<sup>36</sup> Yomi Kazeem, A tomato blight has caused a state of emergency in Northern Nigeria, 26 May 2016, *Quartz Africa*, <https://qz.com/692810/a-south-american-tomato-moth-is-stoking-food-security-fears-in-nigeria/>.

<sup>37</sup> Abubakar Salihi and Agbo-Paul Augustine, The Great Tomato Waste ... Nationwide, *Leadership*, 7 September 2013.

Katsina, Zamfara, Sokoto, Bauchi, Gombe, Taraba and Kano are also active in tomato cultivation. Other major producing areas include Benue, Borno, Plateau, Delta, Kwara and Oyo.

Due to a deficiency in critical inputs and improved technology, low yields and low productivity, high post-harvest losses, a lack of processing and marketing infrastructure, Nigeria is not maximizing its potential in tomato production. According to GEMS4, a joint venture initiative by Coffey, the DFID, the World Bank and the Nigerian government to improve the way markets work for Nigeria's poor, the lack of accurate data has deterred investments in Nigerian tomato farms. GEMS4 is involved in mapping farming clusters in Northern Nigeria. It provides information on location, key social and demographic features, size, varieties grown, average yields and seasonality of the produce. This is to stimulate investment and link tomato farmers to processing plants.<sup>38</sup>

Investments are needed to improve cultivation and productivity. This will include providing quality inputs such as improved seeds, irrigation and greenhouse facilities. In Delta State, tomato cultivation is on the rise, but farmers are finding it labour intensive. Plans to introduce intensive irrigation systems will positively impact tomato cultivation.<sup>39</sup> Thus, investments should seek to revamp inefficient water management regimes. According to a 2011 FAO guide, more than 300 million hectares of land is equipped for irrigation worldwide. Of this, most have been in Asia where rice production is practiced on 80 million hectares, yielding 5 tonnes per hectare. Africa, on the other hand, has only 4% of cropped irrigated land, mainly due to the lack of financial investment.<sup>40</sup>

Private sector investment is also needed to boost tomato production and avoid waste. Post-harvest losses are estimated at about 45% due to poor food supply chain management, seasonal product fluctuations, price instability, inadequate storage, lack of processing facilities and the development of the agro-allied industry. According to farmers, the high level of tomato loss is unsustainable, making farmers choose to plant tomato in the dry season and other crops in the rainy season. This further reduces the availability of tomatoes, a staple food in Nigeria across the nation. Financial and technical support from the private sector and government providing access to cities, markets, good transport systems, packaging and storage facilities, will help prevent post-harvest losses.

Measures being taken to avoid post-harvest losses include the drive to ensure tomato processing is undertaken by small and medium enterprises in the food processing industrial sector. The Bank of Industry and Central Bank of Nigeria are prepared to assist the sector through interventions and funds. Tomato processing is in a prime position to receive such support as it has been identified as one of the crops that will be given priority development in the food processing industrial sector.

Manufacturers of tomato paste are also considering backward integration programmes to ensure an adequate supply of the tomatoes needed to produce tomato paste. Erisco Food Limited, an indigenous manufacturer of food products in Nigeria, has a tomato processing plant with a capacity for 450,000 metric tonnes, with plans to increase its processing capacity. The company recently

---

<sup>38</sup> Mark Hillsdon, the Unofficial 18<sup>th</sup> SDG? It's information: How technology can help tackle the mammoth task of measuring progress on the 17 global goals, *The Guardian*, 26 February 2016.

<sup>39</sup> Egufe Yafugborhi, How Tomato Cultivation is taking root in Delta, *Vanguard*, 6 January 2016, <http://www.vanguardngr.com/2016/01/how-tomato-cultivation-is-taking-root-in-delta/>.

<sup>40</sup> Food and Agriculture Organization of the United Nations. Save and Grow: A policymaker's guide to the sustainable intensification of smallholder crop production, FAO (2011), Chapter 5, <http://www.fao.org/ag/save-and-grow/en/5/index.html>.

acquired 2,700 hectares of land in Kaduna, hoping to partner with farmers to ensure it has a steady supply of tomatoes.<sup>41</sup>

Another company that has taken advantage of the problems and opportunities in Nigeria's tomato value chain, is Tomato Jos. Tomato Jos is a small African agricultural production company set up as a "for-profit" social enterprise by Harvard Business Alumni. The company, which was set up with angel investment, seeks to make farming profitable and sustainable for smallholder farmers. Tomato Jos has a farm and agricultural centre providing education, technological support and bundled inputs to help smallholder farmers grow and harvest crops more efficiently. The company also provides logistics and supply chain support to ensure the produce gets to its food processing and packaging facility.<sup>42</sup>

There are real opportunities for the private sector in cultivation, post-harvest loss reduction, efficiency and profitability across Nigeria's tomato value chain. A number of initiatives have been launched to enable the private sector. YieldWise, a \$130 million initiative launched by the Rockefeller Foundation in 2016, seeks to reduce post-harvest food loss for African farmers. Yieldwise works with private sector partners to fix broken links in the tomato value chain. Through this initiative, farmers are provided with training, opportunities to aggregate with other farmers, and buyer agreement with access to new markets. It also ensures access to technologies and solutions to curb preventable crop loss, as well as financing models and technology innovation to improve storage handling and other production practices.<sup>43</sup>

In Nigeria, YieldWise is working with the Dangote group to establish effective outgrower schemes, which can provide smallholder farmers with a year-round ready buyer and mitigate post-harvest loss. In 2016, the Dangote group launched a \$20 million tomato processing facility in Kano state. The processing plant has a daily production capacity of 1,200 metric tonnes. Annual production, estimated at 400,000 tonnes, has the potential to effectively diminish the need to import tomato paste. About 8,000 farmers have contracted to supply the plant at a guaranteed price of \$700 per ton compared to an average of \$350 domestic market rate. Unfortunately, due to a pest epidemic the year the processing plant was launched, such farmers were unable to supply tomatoes, causing the plant to suspend operations. 2017 news reports suggest these farmers are wary of planting tomatoes, leaving Dangote's plant with a limited supply of this raw material. Tomato growers lost over N2 billion (approximately US\$5.45 million) as a result of pests that affected their farms in 2016.

Yieldwise has been involved in connecting private sector solutions to the post-harvest loss problems. Private sector actors, such as Cold Hubs Ltd, established a walk-in cold storage facility and crate leasing service in Kano. Other private sector actors are expanding into this space as well.<sup>44</sup>

---

<sup>41</sup> Femi Adekoya, Erisco to increase tomato-processing capacity new technology, *The Guardian*, 20 July 2016, <https://guardian.ng/business-services/erisco-to-increase-tomato-processing-capacity-with-new-technology/>.

<sup>42</sup> TomatoJos Website, <http://www.tomatojos.net/the-team/>.

<sup>43</sup> The Rockefeller Foundation, YieldWise: Reducing post-harvest food loss for African farmers, <https://www.rockefellerfoundation.org/our-work/initiatives/yieldwise/>.

<sup>44</sup> Lekan Tobe, Reducing Post-Harvest Loss in the Nigerian Tomato Value Chain, <https://www.pyxeraglobal.org/reducing-post-harvest-loss-nigerian-tomato-value-chain/>.

GEMS4 is also working with the private sector to address post-harvest losses. One such partnership involves Spring Field Agro Nigeria Limited, who obtained a 10 year lease on the Ikara Tomato processing plant from the Kaduna state government. The processing plant, with an installed processing capacity of 16,950 tonnes of tomato, has not been operational for more than 21 years. It also has 700 hectares of land that can be used for tomato farming. The resuscitated plant is not operating at full capacity, with reports citing 20 metric tonnes tomato paste production daily and/or 100 metric tonnes of tomato daily. The production target is 2,500 metric tonnes.<sup>45</sup>

There are investment opportunities to invest in other processing plants that are still non-functional. These include the Manto Tomato processing plant in Gombe State; the Wanunne Tomato Processing Plant in Benue; the Gulf Tomato factory in Jigawa state; and the Lau Tomota processing plant in Taraba state.

### **Eggs and Poultry**

Nigeria is the largest producer of eggs in Africa. In 2011, Nigeria was the top producer of hen eggs with 636,000 metric tonnes valued at \$527.49 million. In 2012, hen egg production was 640,000 metric tonnes. Between 2000 and 2012, the average annual growth rate was 4%, reducing to about 2.5% in 2008.<sup>46</sup> As of 2015, Nigeria is said to produce about 1 billion eggs per annum, valued at approximately N220 billion<sup>47</sup> (approximately \$700 million).

The demand for egg production in Nigeria is on the rise. In 2016, the Federal Government signed a N25 billion (approximately \$80 million) memorandum of understanding with Tuns Farms Nigeria Limited on the National Egg Production (NEGPRO) scheme. The scheme aims to increase egg production in the country to 50 million eggs daily by 2018. It will also seek to ensure that all local governments produce eggs for the National Home-Grown School Feeding programme.<sup>48</sup>

Nigeria also has the second largest chicken population after South Africa, which has 200 million birds. According to a 2015 Sahel Capital report, estimates for Nigeria's poultry industry in 2013 was N80 billion (approximately \$286 million), comprised of about 165 million birds producing 650,000 metric tonnes of eggs and 290,000 metric tonnes of poultry meat.<sup>49</sup> The Green Alternative 2016 estimate of chicken supply is 140 million, with demand at 200 million birds. According to the OECD-FAO Agricultural Outlook for 2014-2023, Nigeria's provisional value for poultry meat production was 270,000 tonnes in 2013. Forecast values for 2017 and 2023 are 329,401 and 406,506 tonnes respectively. At the current rate of production, Nigeria's supply will most likely be inadequate for forecasted demand.

---

<sup>45</sup> Femi Adekoya, Springfield Agro invests N200 million to revive to revive tomato plant, *The Guardian*, 8 March, 2016, <https://guardian.ng/business-services/springfield-agro-invests-n200-million-to-revive-tomato-plant/>.

<sup>46</sup> The Poultry Site, Global Poultry Trends 2013 – Hen Egg Production in Africa and Oceania, 2 April 2014, <http://www.thepoultrysite.com/articles/3119/global-poultry-trends-2013-hen-egg-production-in-africa-and-oceania/>.

<sup>47</sup> Vincent Yusuf and Ibrahim Musa Giginyu, An egg a day will hatch N620bn for Nigeria Annually, *Daily Trust*, 14 October 2015, <https://www.dailytrust.com.ng/news/agriculture/an-egg-a-day-will-hatch-n620bn-for-nigeria-annually/115056.html>.

<sup>48</sup> Aishat Onusi, No Contract Awarded on Egg Production, *FMARD*, 24 July 2016, <http://fmard.gov.ng/no-contract-awarded-on-egg-production/>.

<sup>49</sup> Sahel, An assessment of the Nigerian Poultry Sector, June 2015, <http://sahelcp.com/wp-content/uploads/2016/12/Sahel-Newsletter-Volume-11.pdf>.

OECD-FAO Agricultural Outlook 2014-2023 <sup>1</sup> : MEATS - OECD-FAO Agricultural Outlook 2014-2023

Customise Export Draw chart My Queries

Country	Nigeria										
Variable	Production										
Time	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Commodity											
Beef and veal (cwe)	(P) 355.03	(F) 359.28	(F) 365.63	(F) 370.73	(F) 376.41	(F) 382.19	(F) 388.05	(F) 393.67	(F) 401.05	(F) 410.19	(F) 417.57
Pigmeat (cwe)	(P) 243.66	(F) 253.61	(F) 259.63	(F) 276.54	(F) 286.08	(F) 302.19	(F) 316.19	(F) 331.77	(F) 347.56	(F) 364.03	(F) 380.01
Poultry meat (rtc)	(P) 270.00	(F) 286.03	(F) 300.86	(F) 311.87	(F) 329.41	(F) 340.50	(F) 351.92	(F) 368.09	(F) 381.09	(F) 393.79	(F) 406.56
Sheepmeat(cwe)	(P) 475.00	(F) 473.30	(F) 505.71	(F) 538.72	(F) 569.11	(F) 595.63	(F) 624.55	(F) 668.27	(F) 704.83	(F) 740.96	(F) 778.43

Legend:  
F Forecast value  
P Provisional value  
Data extracted on 12 Jul 2017 10:53 UTC (GMT) from OECD.Stat

Source: OECD Agricultural Outlook, <https://stats.oecd.org/>

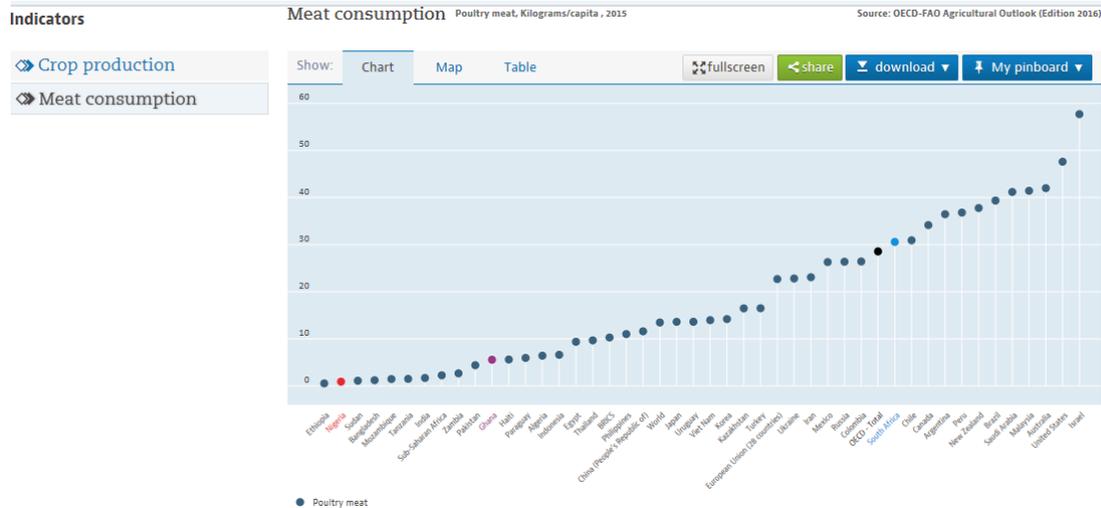
Nigeria's poultry sector has a high market demand and is growing at a fast pace. It has experienced persistent growth in the last 10 years. This is expected to continue because of rising food demands for more protein-rich diets as a result of Nigeria's increasing urbanization. The sector is the most commercialized agricultural sub-sector. It provides over 25% of the agricultural GDP of the Nigerian economy. The Poultry Association of Nigeria notes that the poultry industry grew from 0.7 million exotic chickens in 1963 to an estimated 40 million in 1983.<sup>50</sup> Post 1983, the poultry industry grew further. A 2008 FOA report on the assessment of the Nigerian poultry market chain to improve biosecurity, noted that the poultry population was 150 million, largely made up of local chickens and few exotic birds before the outbreak of the highly pathogenic avian influenza in 2006. Between 2001 and 2011, the poultry industry expanded with chicken meat production from 185,300 metric tonnes to 268,000 metric tonnes respectively.<sup>51</sup>

The sector still has room for growth. According to the FAO poultry sector review 2008, consumption of poultry in Nigeria's rural areas is reserved for special occasions and sourced from stocks kept by households. In urban areas, poultry meat consumption is largely occasional for most families, while egg consumption is more routine.<sup>52</sup> This may explain why Nigeria's consumption of poultry meat per capita is currently very low. The OECD-FAO Agricultural Outlook for 2016 puts Nigeria's consumption of poultry meat in 2015 at 0.9 kg per capita or 190,000 tonnes. This is paltry when compared to Ghana and South Africa. Ghana, Nigeria's much smaller neighbour with a population of 27.41 million (2015 figures), consumes 5.6 kg per capita or 174,000 tonnes. South Africa's population of 54.96 million (2015 figures) consumes 30.6 kg per capita or 1,485,000 tonnes.

<sup>50</sup> Poultry Association of Nigeria, History of PAN, <http://www.poultryassociationng.com/index.php/about-pan/history-of-the-association>.

<sup>51</sup> The Poultry Site, USDA International egg and Poultry: Nigeria, 20 February 2013, <http://www.thepoultrysite.com/reports/?id=1596>.

<sup>52</sup> FAO Animal production and Health Division, Nigeria: Poultry sector country review, 2008 re-edited, <ftp://ftp.fao.org/docrep/fao/011/ai352e/ai352e00.pdf>.



Source: OECD Agricultural Outlook 2016, <https://data.oecd.org/agoutput/meat-consumption.htm>

Similar to rice and tomato, poultry – chicken, eggs and turkey - is barred from access to foreign exchange for imports. The import of live or dead birds, including frozen poultry and bird eggs, but excluding hatching eggs, has been prohibited. Nevertheless, large amounts of poultry meat are smuggled into Nigeria. The 2015 Sahel Capital Report notes that Eurostat statistics suggest that between 2009 and 2011, over 3 million metric tonnes of poultry products imported into the Republic of Benin, ended up in Nigeria. The Report also notes that an annual growth rate of 20% is projected for Nigeria’s poultry industry between 2010 and 2020.

Despite the rapid growth and demand of Nigeria’s poultry sector, there are a number of challenges across the value chain. These challenges are also investment opportunities. One major challenge in Nigeria’s poultry sector is the availability of maize and soya bean at reasonable prices. Very high input costs affect the production of poultry in Nigeria. The USDA International Egg and Poultry Report 2013 noted that the high price of soya bean from \$485 a ton in 2010 to \$775 a ton in 2011, led to the use of low quality animal feed as substitutes.

Olam International, a Singapore agri-business, is investing \$150 million in integrated animal feed mills, poultry breeding farms and a hatchery in Kaduna and Kwara State. Olam’s venture into animal feed will help ensure good quality feed, boost poultry production and reduce the country’s imports. Upon completion and operating at full capacity, the feed mills will produce over 600,000 tonnes per annum of high quality poultry and fish feed. The Kaduna facility will supply the feed to Northern markets, while the Kwara state facility will supply markets in the southwest. Inputs for the feed mills will be locally sourced. The poultry breeding farm in Kaduna is expected to produce over 1 million hatching eggs for the hatchery. Olam plans to create over 100,000 metric

tonnes of in-house storage capacity and provide technical support for local poultry farmers. It also plans to engage and get involved in the school feeding programme in Kaduna state.<sup>53</sup>

The Olam case study illustrates the benefits of private sector investment in the poultry industry. The commercial feed market is expected to grow at over 10% annually for the next 5 years. The demand for poultry products is set to increase.

Another challenge is the outbreak of avian influenza. Nigeria has had a number of outbreaks of avian influenza since the first case in 2006. In January 2017, the government held a meeting initiated by the FMARD to review past experiences and provide implementable preventive measures against bird flu. Regulation of the poultry industry and adherence to biosecurity and hygienic practices were also considered.<sup>54</sup> Private sector investments could help poultry farmers with biosecurity and disease prevention plans.

Transport infrastructure and logistics is another area in dire need of investments across the whole agricultural industry in Nigeria. For eggs and meat poultry, cold chain logistics will improve distribution, as well as prevent loss. A number of Singapore companies are able to offer cold chain logistics. It would be beneficial for such companies to explore collaboration and partnerships in the cold chain logistics sector in Nigeria.

Investments for egg processing in Nigeria is another opportunity. Nigerian egg farmers occasionally experience an egg glut. The potential increase in egg production as a result of programmes such as NEGPRO, could further lead to egg glut. This is more so because of Nigeria's inadequate infrastructure provisions, limitations in food processing and technology, and poor food supply chain management. These problems present investment opportunities related to training, storage and processing. Egg farmers need to be educated on storage techniques. Investments in advanced technology on egg conversion to liquid or powder form and industrial utilization of eggs would be beneficial.<sup>55</sup>

A wholly owned Nigerian registered company, Answer Industries Limited, produces chicken egg powder called kara-kara.<sup>56</sup> Investors could consider processing different types of dry egg products, which will require modern and technological facilities. Avangardco in Ukraine has a good processing facility, which could be used as a case study.<sup>57</sup>

Overall, areas of investment include providing poultry housing equipment, breeding, poultry feeding, watering and cleaning systems, feed milling machinery, poultry drugs, preservation technologies, and meat processing.

---

<sup>53</sup> Olam breaks ground on Nigeria's largest integrated animal feed mill, poultry breeding farms and hatchery in Kaduna State, 8 April 2016, <http://olamgroup.com/news/olam-breaks-ground-nigerias-largest-integrated-animal-feed-mill-poultry-breeding-farms-hatchery-kaduna-state/#sthash.mjiLcC4R.dpbs>.

<sup>54</sup> Nigeria: Poultry Business in Nigeria and the threat of Avian Flu, *Agronews*, 8 February 2017, <http://agronewsng.com/news/poultry-business-in-nigeria-and-the-threat-of-avian-flu/>.

<sup>55</sup> Paul Adoyi, Prospect, price and peril of poultry industry in Nigeria, 9 July 2013, <https://pauladoyi.wordpress.com/2013/07/09/prospect-price-and-peril-of-poultry-industry-in-nigeria/>.

<sup>56</sup> Answer Industries Limited Website, <http://answerindustriesltd.com.ng/aboutus.php>.

<sup>57</sup> Avangardco website, <http://avangardco.ua/en/investor-relations/nasha-kompanija/>.

## Fruit Juice Production

Nigeria is the largest producer of pineapples in Africa. Other fruits, such as papaya, mangoes and guava, are produced in large quantities across Nigeria. According to the FAO, Nigeria produced almost 3.8 million tonnes of citrus fruit in 2014. Africa as a whole produced an estimated 4.8 million tonnes.

			2014		
			Unit	Value	Flag Description
[-] Nigeria	[-] Area harvested	Fruit, citrus nes	ha	791,524	FAO data based on imputation methodology
		Fruit, fresh nes	ha	185,118	FAO data based on imputation methodology
	[-] Production	Fruit, citrus nes	tonnes	3,783,826	FAO data based on imputation methodology
		Fruit, fresh nes	tonnes	1,255,902	FAO data based on imputation methodology
	[-] Yield	Fruit, citrus nes	hg/ha	47,804	Calculated data
		Fruit, fresh nes	hg/ha	67,843	Calculated data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

			2014		
			Unit	Value	Flag Description
[-] Africa	[-] Area harvested	Fruit, citrus nes	ha	947,084	Aggregate, may include official, semi-official, estimated or calculated data
		Fruit, fresh nes	ha	781,287	Aggregate, may include official, semi-official, estimated or calculated data
	[-] Production	Fruit, citrus nes	tonnes	4,783,218	Aggregate, may include official, semi-official, estimated or calculated data
		Fruit, fresh nes	tonnes	5,038,829	Aggregate, may include official, semi-official, estimated or calculated data
	[-] Yield	Fruit, citrus nes	hg/ha	50,505	Calculated data
		Fruit, fresh nes	hg/ha	64,494	Calculated data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

With Nigeria's abundance of fruit, huge domestic market and export potential, the fruit industry has great investment potential. Nigeria's expanding middle class and low income group are recognizing the nutritional value of fruit, and have indicated a preference for fruit juice rather than carbonated soft drinks for health reasons. However, much of the fruit produced in Nigeria wastes away due to the lack of processing capacity, limited demand, poor handling and transportation of produce to markets and processors.<sup>58</sup> As a result, much of the local fruit is not used for fruit juice. This is unfortunate as the fruit juice market in Nigeria is thriving and in high demand.

According to the USDA Global Agricultural Information Network report on food processing in Nigeria, Nigeria's demand for imported fruit juice concentrate and premix grew from 1,500 metric tonnes in 2002 to about 58,000 metric tonnes in 2012. In 2016, the Manufacturers' Association of Nigeria said N165 billion (approximately \$524 million) was spent on fruit juice imports annually. Nigeria allows the import of fruit juice concentrates in drums for local re-packaging. It prohibits the import of fruit juice in retail packs.

Key flavours for fruit juice in Nigeria include orange, pineapple, mixed fruit, apple, grape and mango. There are a number of dominant players in the market, including CHI, Dansa Food Limited, C-Way Food and Beverages Limited, Dangote Group of Companies, Danico Foods Limited, Frutta Juice and Service Nigeria Limited, Fumman Agricultural Industries Limited and Jamil Nigeria. According to Euromonitor International, CHI was the leading brand in Nigeria with off trade volume share of 33% and off trade value share of 35% in 2016. CHI's long presence in Nigeria has helped it gain strong knowledge of the market. It has a strong distribution network and merchandising activities. It has a wide range of products that are visible, available and advertised. In January 2016, Coca-Cola Company acquired a 40% stake in Chi Ltd, a subsidiary of the Tropical Investments Group. The plan is to increase the holding to 100% within 3 years, subject to regulatory approval. CHI is hoping to expand local sources of raw materials.<sup>59</sup>

Other players are also investing in the expansion of local sourcing of raw materials. In 2015, Coca-Cola launched a new product called five alive pulpy orange fruit juice, made from concentrate.<sup>60</sup> Teragro, the agribusiness subsidiary of Transnational Corporation of Nigeria Plc, is the sole local concentrate partner for the drink. Teragro produces orange and pineapple concentrates, mango purees and orange peel for industrial markets. The company operates a 26,500 metric ton capacity plant in Benue State.<sup>61</sup>

With the fruit juice market in Nigeria maturing, an area of the market still relatively untapped is coconut production and processing. Investors should consider this sector. According to Technavio,

---

<sup>58</sup> USDA, Global Agricultural Information Network, Nigeria: Food Processing Ingredients, 20 November 2013, [https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Processing%20Ingredients\\_Lagos\\_Nigeria\\_11-20-2013.pdf](https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Processing%20Ingredients_Lagos_Nigeria_11-20-2013.pdf).

<sup>59</sup> Euromonitor International, Juice in Nigeria, March 2017, <http://www.euromonitor.com/juice-in-nigeria/report; Marketing Edge, Chi fruit brand tops segment with 33% market share in 2016, 15 March, 2017, http://www.marketingedge.com.ng/2017/03/15/chi-fruit-juice-brands-top-segment-with-33-market-share-in-2016/>.

<sup>60</sup> Maggie Fick, Coca-Cola buys stake in Nigerian juice and dairy company CHI, 30 January 2016, <https://www.ft.com/content/b9b54990-c668-11e5-b3b1-7b2481276e45?mhq5j=e3>.

<sup>61</sup> Teagro, Transcorp Plc Agribusiness Arm Partners with Coca-Cola on New Five Alive Pulpy Orange Juice, 9 September 2015, [http://teragro-ng.com/site/?page\\_id=2272](http://teragro-ng.com/site/?page_id=2272).

the coconut water market can generate up to US\$ 4 billion between 2015 and 2019.<sup>62</sup> In recent years, the global consumption of coconut water or juice has increased. In 2015, the global consumption of coconut water was estimated at 675 million litres, an increase of 15% from the 2014 figures of 587 million litres.<sup>63</sup>

In Nigeria, coconut is a cash crop grown in 22 of Nigeria's 36 states. Many such states are in the north, including Niger, Kano, Jigawa, Zamfara, Kebbi, Sokotom Katsina, Kaduna, Taraba, Adamawa, Yobe, Plateau and Nassarawa. Lagos and Ogun in the southwest are also producers. Production is highest in Lagos.<sup>64</sup> States such as Cross Rivers are looking into investments in cultivation and production. In 2014, Nigeria was ranked 18<sup>th</sup> on the world coconut production index (FAO). Nigeria produced 267,250 metric tonnes of coconut.<sup>65</sup>

Coconut can be used as raw materials for a number of industries, including pharmaceuticals, cosmetics, household products, and food and beverage. Nigeria's abundant coconut resource creates investment opportunities in coconut processed foods, such as coconut water, coconut milk, coconut cream, coconut water vinegar and coconut oil. Coconut water has health benefits that could appeal to a more health conscious Nigerian population.

Euromonitor reports that Foco Coconut water is available for the first time in Nigeria. Foco Coconut water comes from plantations in Southeast Asia and is packaged in Vietnam and Thailand. Investors should consider producing, processing and packaging coconut water and other coconut products in Nigeria. However, for the coconut value chain to be productive in Nigeria, investments are needed for improved yields, plantations of new trees, fertilizers, coconut processing and other parts of the value chain. Problems surrounding land acquisition also need to be addressed.

### Cashew and Groundnuts (Mixed Nuts and Fruits)

Nigeria is a major producer of peanuts and cashews. FAO official data for peanut production in 2014 was 3.4 million tonnes. Nigeria was the third largest producer after China and India. Cashew production in Nigeria is more difficult to estimate. The FAO estimates Nigeria's 2014 production of cashew nuts with shell as 894,368 tonnes. According to this figure, Nigeria was the largest producer of cashew nuts in the world.

			2014		
			Unit	Value	Flag Description
Nigeria	Production	Cashew nuts, with shell	tonnes	894,368	FAO data based on imputation methodology
		Groundnuts, with shell	tonnes	3,413,100	official data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

<sup>62</sup> Technavio, Coconut water market, key market research findings, 23 September 2015, <https://www.technavio.com/pressrelease/global-coconut-water-market-to-grow-at-a-high-cagr-of-more-than-25-by-2019-says>.

<sup>63</sup> CBI, Exporting Coconut Water to Europe, 5 December 2016, <https://www.cbi.eu/market-information/processed-fruit-vegetables-edible-nuts/coconut-water/>.

<sup>64</sup> Steve Agbota, Coconut farming as huge forex earner, *The Sun*, 21 November 2016, <http://sunnewsonline.com/coconut-farming-as-huge-forex-earner/>.

<sup>65</sup> Nigeria: Coconut Tree might become extinct in Nigeria in 50 years, *The Sun*, 23 October 2016, <http://sunnewsonline.com/coconut-trees-might-become-extinct-in-nigeria-in-50-years/>.

However, the figure for cashew production quoted by Nigerian government officials and stakeholders for 2014, is much less at 120,000 metric tonnes. Production was said to increase to 150,000 metric tonnes in 2015, with the hope of doubling this figure by 2018.<sup>66</sup>

CBI, in its report on exporting cashew nuts to Europe, states that the Ivory Coast and Nigeria are the two largest producers of cashew in West Africa. The Ivory Coast is investing significantly in cashew production, with plans to become the world's leading cashew producer. The country is developing high-yielding cashew varieties, led by research in the National Agricultural Research Centre, Polytechnic Institute in Yamaussoukro and the Ivorian Cotton and Cashew Board. In 2015-2016, Ivory Coast produced 171,111 metric tonnes or 23% of global production. India, the largest producer, produced 172,719 metric tonnes during the same period.<sup>67</sup>

To increase cashew productivity in Nigeria, investments are needed to improve yields, plant new trees, add value to the processing of cashew apples, revamp peeling techniques, handling and packaging and local cashew processing.<sup>68</sup> These productivity challenges, which need to be addressed, are similar to those already mentioned for the other agricultural products discussed in this report. A secondary investment relevant for cashew handling and packaging, is the production of jute bags in Nigeria. Nigeria currently spends over \$20 million on the importation of jute bags. Jute bags are made from Kenaf, which can be grown in commercial quantities in many states in Nigeria. Kenaf is a plant used for food and non-food products.<sup>69</sup>

Cashew is a major cash crop in Nigeria. In 2013, cashew was the third largest agricultural foreign exchange earner, providing about US\$110 million.<sup>70</sup> It is grown in two thirds of Nigeria's 36 states, particularly the eastern, western and middle belt states. Cashew is targeted by the Nigerian government as one of a number of crops, including banana, avocado and mango, that will be prioritized for export from 2018 onwards. The FMARD is supporting the development of the value chain.

Despite, Nigeria's large production of cashews, the country does not process much of its cashew nuts. According to the third quarter 2015 report on cashews by the International Trade Center, Nigeria processes about 50,000 metric tonnes of raw cashews and exports this product to countries including Singapore, India, Vietnam, the UAE and Hong Kong. The CBI report on cashew notes that West Africa produces about 46% of global cashew, which is mostly exported as raw cashew nut in shell to India, Vietnam and Brazil for shelling and processing. However, this may be changing as major international companies from countries, including India, Vietnam, China, Brazil and Europe, are investing in medium and large scale processing units in African production areas. Cashew processing is therefore a good area for investment in Nigeria.

---

<sup>66</sup> Keynote Address Delivered by the Honourable Minister of Agriculture and Rural Development, Chief Audu Ogbeh, OFR, at 2016 Cashew Festival, 29 February 2016, [http://ncan.org.ng/pubilaction\\_details.php?tid=2&tg\\_id=4&pid=43&cid=1&pg=Aboutus.php](http://ncan.org.ng/pubilaction_details.php?tid=2&tg_id=4&pid=43&cid=1&pg=Aboutus.php).

<sup>67</sup> CBI, Exporting Cashew Nuts to Europe, 7 December 2016, <https://www.cbi.eu/node/2610/pdf/>.

<sup>68</sup> International Trade Centre, Nigeria: Rundown on Cashew situation by Market Insider, 3 February 2015, <http://www.intracen.org/itc/blogs/market-insider/Nigeria-rundown-on-cashew-situation/>.

<sup>69</sup> James Emejo, Nigeria: Minister worries US \$20 million spent on Jute bags importation in 2015, *This Day*, 13 July 2016, <http://allafrica.com/stories/201607131086.html>.

<sup>70</sup> International Trade Centre, Edible Nuts: Cashew Market Insider, Third Quarter 2015, [http://www.intracen.org/uploadedFiles/intracenorg/Blogs/Cashew\\_Nuts\\_-\\_Main/Cashew%20quarterly%20bulletin%20Q3\\_Final.pdf](http://www.intracen.org/uploadedFiles/intracenorg/Blogs/Cashew_Nuts_-_Main/Cashew%20quarterly%20bulletin%20Q3_Final.pdf).

The International Trade Centre 2015 third quarter report also notes that Nigeria's huge population provides a large ready domestic market for mixed nuts packaging. Edible nuts such as peanuts and cashew nuts are popular snacks in Nigeria. The consumption of cashew nuts, peanuts and other branded mixed nuts sold in supermarkets is growing at a steady pace among the middle and high income population. Unbranded nuts are also sold at traffic hold-ups and local stores. Bananas, coconuts, guavas, mangoes, oranges, papaya and pineapples are plentiful in Nigeria and can be used as dried fruit snacks. With increased awareness about the health benefits of nuts and dried fruits as snacks, there is potential for investments in the edible nuts and dried fruit sector.

Agrolay Ventures, founded by Ada Osakwe, who was once seconded to Akinwumi Adesina, Nigeria's former agriculture minister, has done a lot of work on investment opportunities in the agro-business industry. Agrolay has private investment in Nuli Juice and ReelFruit.<sup>71</sup> Nuli Juice is the first cold-pressed vegetable and fruit juice company certified by NAFDAC. Reelfruit is a Nigerian company currently involved in the packaging of nuts and dried fruits. Reelfruit imports produce from Ghana and Benin for its dried fruit business due to Nigeria's unreliable supply and high transport costs.<sup>72</sup> Reelfruit products are dried in Ogun state and packaged in Lagos and distributed across Nigeria and some West African Countries. Plans for export to the US and Europe are in the pipeline. Reelfruit is also looking for a US\$600,000 investment to build a bigger plant. The company has a range of 5 products – mango, pineapple, cashew, banana and coconut, with a price range of Naira 150 to 400<sup>73</sup> (approximately \$0.48 to \$1.27).

### **Cassava Production in Nigeria**

Nigeria is the largest producer of cassava in the world. According to the FAOSTAT 2014, Nigeria produced 54.8 million metric tonnes of cassava. Thailand was the second largest producer with 30 million metric tonnes. Ghana, the DRC and Angola were the other African countries making up the top ten producers with 16.5, 14.6 and 7.6 million tonnes respectively.

Cassava production in Nigeria accounts for about 21% of the total global cassava output. Between 2004 and 2013, cassava production in the country grew at an average of 4% per annum.<sup>74</sup> Cassava is needed for food and industrial purposes in Nigeria. A number of local foods such as gari, fufu and tapioca are made from cassava. Industrial products made from cassava include ethanol, starch, cassava flour, glucose syrup and sweetener.<sup>75</sup> In July 2015, the Cassava: Adding Value for Africa Phase II (C:AVA II) project blog reported that domestic demand for cassava is expected to reach \$8.5 billion dollars by 2020, with the industrial use of cassava expected to grow 5 times.<sup>76</sup>

---

<sup>71</sup> Agrolay website, <https://www.agrolay.com/>.

<sup>72</sup> Chris Stein, Currency controls force Nigerian manufacturers to buy locally, Financial Times, 27 November 2016, <https://www.ft.com/content/160b19a4-8978-11e6-8cb7-e7ada1d123b1>.

<sup>73</sup> Nigeria: Nigerian Entrepreneur blazing a trail in agribusiness, Africa News, 6 January 2016, <http://www.africanews.com/2016/01/06/nigerian-entrepreneur-blazing-a-trail-in-agribusiness/>.

<sup>74</sup> IDH, the sustainable trade initiative, Grow Africa and Dalberg Global Development Advisors, Market Opportunities for Commercial Cassava in Ghana, Mozambique and Nigeria, June 2015, <https://www.growafrica.com/resources/new-study-market-opportunities-commercial-cassava-grow-africa-secretariat-idh-and-dalberg>.

<sup>75</sup> NCGA, Cassava can Inject 10 Trillion Naira Yearly Into the Economy, 20 September 2016, <http://ncgaonline.org/cassava-can-inject-10-trillion-naira-yearly-into-the-economy/>.

<sup>76</sup> CAVA II, <http://cavaiiproject.blogspot.sg/2015/07/>.

However, current cassava production and processing in Nigeria is unlikely to address the expected demand. Investments are needed to help Nigeria achieve the maximum growth potential in the cassava industry. Investors can tap into the huge potential in the cassava value chain. These include improved cultivation and yields, and processing cassava into industrial products.

### **Cassava Production**

Cassava, a popular food and cash crop, is mostly produced in the middle belt and southern part of Nigeria. In 2004, Benue and Kogi were the largest producers of cassava. Other dominant producers include Cross Rivers, Akwa Ibom, Rivers and Delta state in the South, Ogun, Ondo and Oyo in the South West, and Enugu and Imo in the South East. Kaduna state in the North East and Taraba state in the North West are also major producers of cassava.<sup>77</sup> IITA's Nigeria cassava monitoring survey published in February 2017 involved 16 states. The 16 states included all the states listed here, as well as Ekiti, Osun and Anambra. These 16 states account for 80% of Nigeria's cassava production.<sup>78</sup>

To increase cassava production in Nigeria, yields and area cultivated need to be improved. This would require more acquisition of land suitable for cassava cultivation. The Cassava Growers Association (CGA) has called for 5 million hectares of arable land to be devoted to industrial cassava production. Such investments can yield a harvest of 40 metric tonnes per hectare or 200 million metric tonnes per year. The CGA has been involved in initiatives to acquire more cassava cultivation land. In 2016, the CGA reported that it had acquired 10,000 hectares of land in Ekiti state for ethanol production.<sup>79</sup>

Farmer clusters can also increase yields using shared inputs, such as mechanized equipment, high yield varieties and improved farming practices. In 2004, an FAO report on the cassava industrial revolution in Nigeria noted the CGA had about 500 groups involved in cluster farming, with each group cultivating about 30 hectares. While the benefits of such clusters include improved access to the use of tractors, pest control and efficiency, the FAO report noted the provision of inappropriate tractors jeopardized the success of those clusters.<sup>80</sup> Sahel Capital notes that Nigeria's average yield of 7.7 metric tonnes per hectare (FAO, 2014 figures) is very low when compared with countries like Indonesia and Thailand, with 23.4 metric tonnes per hectare and 22.2 metric tonnes per hectare respectively.<sup>81</sup> Nigeria needs efficient farming techniques, which investments can help secure.

Increased cassava production would also require new varieties to boost production. In 2013, the International Institute of Tropical Agriculture released two improved cassava varieties, which have

---

<sup>77</sup> FAO, A cassava Industrial Revolution in Nigeria, [http://www.iita.org/wp-content/uploads/2017/The\\_Cassava\\_Monitoring\\_Survey\\_in\\_Nigeria.pdf](http://www.iita.org/wp-content/uploads/2017/The_Cassava_Monitoring_Survey_in_Nigeria.pdf).

<sup>78</sup> IITA, The Cassava Monitoring Survey in Nigeria, February 2017, [http://www.iita.org/wp-content/uploads/2017/The\\_Cassava\\_Monitoring\\_Survey\\_in\\_Nigeria.pdf](http://www.iita.org/wp-content/uploads/2017/The_Cassava_Monitoring_Survey_in_Nigeria.pdf).

<sup>79</sup> NCGA, Cassava can Inject 10 Trillion Naira Yearly Into the Economy, 20 September 2016, <http://ncgaonline.org/cassava-can-inject-10-trillion-naira-yearly-into-the-economy/>.

<sup>80</sup> FAO, Global Cassava Development Strategy, A cassava industrial revolution in Nigeria: The potential for a new industrial crop, 2004, <ftp://ftp.fao.org/docrep/fao/007/y5548e/y5548e00.pdf>.

<sup>81</sup> Sahel, Cassava, A Staple Crop in Nigeria, [http://sahelcp.com/wp-content/uploads/2016/12/Sahel\\_Newsletter\\_Volume\\_13.pdf](http://sahelcp.com/wp-content/uploads/2016/12/Sahel_Newsletter_Volume_13.pdf).

helped Nigeria maintain its lead in cassava production. The varieties perform well in different cassava production regions with potential for increased yields of between 49-53 tonnes per hectare as compared to local varieties which yield less than 10 tonnes per hectare.<sup>82</sup>

The Building an Economically Sustainable Integrated Cassava Seed Systems project in Nigeria, funded by the Bill and Melinda Gates Foundation, seeks to ensure the availability of certified quality cassava seeds. The project has the potential to increase yields by 40%, enabling smallholder farmers, which make up the majority of cassava farmers, to produce high quality cassava.<sup>83</sup> Overall, investments in land acquisition, new varieties, improved farming practices and equipment are needed to increase productivity.

### Cassava Processing

Cassava processing in Nigeria is a lucrative market for investors. It is useful for food and non-food industries. In 2001, only 16% of cassava root production in Nigeria was utilized as industrial raw materials. 10% was used for animal feed, 5% as syrup concentrate and less than 1% for HQCF and other products. In 2014, the commercial use of cassava was only 165,000 metric tonnes or 0.3% of supply. The latent demand for industrial cassava is estimated at 4.8 million metric tonnes, while realistic demand is about 1.8 million metric tonnes.<sup>84</sup>

One example of the huge potential of cassava processing for industrial purposes is the production of industrial starch. Currently, Nigeria imports 95% of industrial starch, despite high production levels of cassava raw material. Industrial starch is needed in a number of industries, including pharmaceutical, paper, textile and the adhesives industry.<sup>85</sup> Pharmaceutical companies in Nigeria need modified starch for their products. Modified cassava starch is not readily available locally, giving rise to importing corn starch.<sup>86</sup> Ethanol for biofuel use also has huge potential.

Investors should also consider investments in food-grade ethanol, food-grade starch, high quality cassava flour (HQCF), glucose and sweeteners.<sup>87</sup> The value which can be derived can be seen from Cargill's aborted plan to invest \$100 million in a cassava processing facility to produce starch and sweeteners at the staple processing zone in Kogi state. At the time (2014), production of the sweeteners would have reduced Nigeria's dependence on sugar imports of N217 billion annually (approximately, \$600 million).<sup>88</sup> In 2016, news reports stated that Union Dicon Salt (UDS) Plc, an

---

<sup>82</sup> IITA, Nigeria releases improved cassava varieties to boost productivity, 14 January 2013, <http://www.iita.org/news-item/nigeria-releases-improved-cassava-varieties-boost-productivity/>.

<sup>83</sup> Sahel, Cassava, A Staple Crop in Nigeria, [http://sahelcp.com/wp-content/uploads/2016/12/Sahel\\_Newsletter\\_Volume\\_13.pdf](http://sahelcp.com/wp-content/uploads/2016/12/Sahel_Newsletter_Volume_13.pdf).

<sup>84</sup> IDH, Dalberg, Cassava Industrialization in Nigeria Factsheet, <https://www.growafrica.com/resources/factsheet-cassava-industrialization-nigeria>.

<sup>85</sup> Caleb Ojeale, \$51 billion potential seen in cassava value chain (Nigeria), *BusinessDay*, 19 May 2016, <https://asokoinsight.com/news/51-billion-potential-seen-cassava-value-chain-nigeria>.

<sup>86</sup> Businessday online, Nigeria, biggest cassava producer, imports 95% of starch, 21 February 2017, <https://www.businessdayonline.com/nigeria-biggest-cassava-producer-imports-95-starch/>.

<sup>87</sup> IDH, Dalberg, Cassava Industrialization in Nigeria Factsheet, <https://www.growafrica.com/resources/factsheet-cassava-industrialization>.

<sup>88</sup> Cassavamillers, The staple crop processing zone takes off with cassava in Kogi state, undated, <http://cassavamillers.com/studies-and-papers/the-staple-crop-processing-zones-scpzs-takes-off-with-cassava-in-kogi-state>.

indigenous Nigerian company, had replaced Cargill as core investor in the cassava processing facility. According to a 2016 company bulletin, UDS Plc will also establish cassava processing facilities in Edo and Delta state.<sup>89</sup>

Thai Farm International (TFI), a member of the Flour Mills Nigeria (FMN) group, is the largest processor of locally grown cassava tuber and producer of HQCF. TFI was founded in 2006 by Asian and Nigerian shareholders and acquired in 2012 by FMN. TFI also produces a by-product, siftings (as a result of its fine sifting process), which is used by a local feed company. TFI's plant is located in Ososa, Ogun State, with a capacity of 60 metric tonnes of flour per day. There are plans to increase capacity to 90 metric tonnes per day, which can process 300 metric tonnes of raw cassava roots per day. TFI purchases cassava from over 2,000 cassava farmers for use in its HQCF. To ensure adequate supply, it also invests in its own farming operations and supports local farmers migrating from subsistence to commercial farming operations. The company provides its waste products, peels and skins as organic fertilizer for its supplier farmers.<sup>90</sup>

The use of cassava in composite flours to make bread and other baked goods, if carried out purposefully and properly, can help reduce Nigeria's dependence on imported wheat. Nigeria spends an estimated \$6 billion on wheat imports and the inclusion of cassava and sorghum may help save about \$3.5 billion annually.<sup>91</sup> Nigeria's attempt so far to use composite flour, including cassava for bread and baked goods, although widely canvassed, has had limited success. Reasons for the failure include policy decisions, limited consumer demand, lack of technical expertise and private sector investment.

In 2002, the administration of President Obasanjo launched the Presidential Initiative on cassava to earn foreign exchange and achieve self-sufficiency in food production. The initiative mandated a 10% inclusion of cassava flour in wheat flour manufacturing, 10% blend of ethanol with premium motor spirit and natural use of cassava starch by industry. The initiative piqued the interest of a large number of farmers and entrepreneurs in cassava processing firms. It created the nationwide development of about 120 micro cassava processing centres, valued at over N1 billion (approximately \$2.75 million).<sup>92</sup>

However, President Yaradua's administration, which came into power in 2007 after President Obasanjo, revised the cassava flour inclusion from 10% to 5%. There were allegations the revised requirement of 5% was not strictly enforced. The administration also relaxed the ban on cassava products such as flour, chips and starch. The policy reversal led to huge losses for farmers and processors involved, as flour millers stopped buying cassava flour. The flour millers claimed the flour was of low quality due to poor quality control of flour produced by the large number of small scale cassava processing factories.<sup>93</sup>

---

<sup>89</sup> Union Dicon Slat Plc, UDS Plc continues implementation of transformation strategy, 8 April 2016, [http://udsplc.com/images/UDS\\_Bulletin\\_April\\_2016.pdf](http://udsplc.com/images/UDS_Bulletin_April_2016.pdf).

<sup>90</sup> Thai Farm International website, <http://www.tfinigeria.com/profile.aspx>.

<sup>91</sup> Chika Izuora, Nigeria: Cassava, Sorghum Bread Initiative to Save Nigeria \$3.5 Billion Annually, *Leadership*, 25 May 2017, <http://leadership.ng/2017/05/25/cassava-sorghum-bread-initiative-save-nigeria-3-5bn-annually/>.

<sup>92</sup> This Day Editorial, Nigeria: The Presidential Initiative on Cassava, *Africa news*, 24 October, 2010, <http://allafrica.com/stories/201010250997.html>.

<sup>93</sup> This Day Editorial, Nigeria: The Presidential Initiative on Cassava, *Africa news*, 24 October, 2010, <http://allafrica.com/stories/201010250997.html>.

According to Cassava: Adding value for Africa (C:AVA), the Presidential Initiative on cassava raised high quality cassava flour (HQCF) production to an estimated 40,000 metric tonnes. By 2009, sales of HQCF plunged and many small and medium enterprises shut down. The C:AVA project, which began in 2010, helped revive the cassava value chain.<sup>94</sup> This was achieved through advocacy campaigns, practical demonstrations of the use of HCQF in products and stakeholder discussions to address challenges of the cassava subsector. C:AVA was also involved in training to help the government assess the national capacity to deliver HCQF and the design and development of new model flash dryers, as well as retrofit flash dryers that helped increase flour productivity.<sup>95</sup>

Investors could therefore consider cassava processing investments in high quality flour, cassava flour processing equipment, composite blending equipment and adequate research and development into composite flour products. Honeywell Flour Mills Plc, a major flour milling company in Nigeria, stated in 2015 that it had achieved 2.5% HQCF out of the required 10% inclusion with a view to reaching 10% by 2016. It is unclear if the company has achieved this goal.<sup>96</sup>

The Federal Institute of Industrial Research Oshodi, Lagos (FIRO) which recognizes the need for a standardized national recipe for cassava bread and confectioneries, would be useful for partnerships. FIRO is pushing for legislation that will require flour millers to adopt the cassava initiative. The initiative aims to require 20% cassava inclusion in bread.<sup>97</sup> The Institute of Food Technology in Rio de Janeiro, Institute of Grain, Flour and Bread, the Netherlands and Tropical Products Institutes have carried out experiments on the possibility of making good quality bread. They may be useful for research and development, bearing in mind the challenges of using composite flour for bread and other baked products.<sup>98</sup>

Ethanol, starch, glucose and sweeteners also have high investment potential. According to IDH and the Dalberg factsheet on cassava industrialization in Nigeria, approximately 200 million litres of food grade ethanol is imported annually. 30,000 metric tonnes of starch for use in the food and beverage industry and over 90,000 metric tonnes of glucose sweetener are also imported.<sup>99</sup> Local processing of cassava would reduce those numbers, providing good returns for investors, easy access to raw materials for industries, and growth for Nigeria.

Overall, it is important to note that it is advisable for processors to invest 40-50% in commercial farming and engage with small scale farmers to ensure high quality cassava produce and adequate supply, which would guarantee demand. Approximately 90% of cassava is cultivated by smallholder farmers for consumption as traditional foods. The Allied Atlantic Distiller Limited (AADL) is a good example of a company that has tapped into the cassava industrialization

---

<sup>94</sup> C:AVA, Nigeria: country overview, <http://cava.nri.org/focus-countries/nigeria/country-overview>.

<sup>95</sup> C:AVA, Nigeria: success stories, <http://cava.nri.org/focus-countries/nigeria/success-stories>.

<sup>96</sup> Fabian Odum and Paul Adunwole, Honeywell Oils Cassava-Wheat Flour Production Line, *The Guardian*, 17 January 2015, <https://guardian.ng/features/agro-care/honeywell-oils-cassava-wheat-flour-production-line/>.

<sup>97</sup> Chika Izuora, Nigeria: Cassava, Sorghum Bread Initiative to Save Nigeria \$3.5 Billion Annually, *Leadership*, 25 May 2017, <http://leadership.ng/2017/05/25/cassava-sorghum-bread-initiative-save-nigeria-3-5bn-annually/>.

<sup>98</sup> FAO Corporate Document Repository, Cassava processing: Cassava starch and its uses, <http://www.fao.org/docrep/x5032e/x5032E06.HTM>.

<sup>99</sup> IDH, Dalberg, Cassava Industrialization in Nigeria Factsheet, <https://www.growafrica.com/resources/factsheet-cassava-industrialization-nigeria>.

potential in Nigeria. The company was founded by a company involved in the spirits industry. AADL has the capacity to produce 9 million litres of ethanol per year. It engages with smallholder farmers to ensure adequate cassava for its plant. It also provides farmers with technical assistance, access to inputs and improved varieties. Yields have increased to 16-20 metric tonnes per hectare. This is comparable with the typical 10-12 metric tonnes per hectare prevalent in the country.<sup>100</sup>

### Oil Palm Production in Nigeria

Nigeria is the world's 5<sup>th</sup> largest producer of palm oil.<sup>101</sup> In 2014, Nigeria was the 4<sup>th</sup> largest producer with an estimated 7,962,213 tonnes of oil palm fruit and 910,000 tonnes of palm oil (unofficial figure). During the same period, Indonesia produced an estimated 126.7 million tonnes of oil palm fruits and 29.3 million tonnes of palm oil. Malaysia produced 96 million tonnes of oil palm fruit and 19.7 million tonnes of palm oil.

			2014		
			Unit	Value	Flag Description
Indonesia	Area harvested	Oil, palm			
		Oil, palm fruit	ha	7,428,752	FAO data based on imputation methodology
	Production	Oil, palm	tonnes	29,278,200	Official data
		Oil, palm fruit	tonnes	126,684,128	FAO data based on imputation methodology
	Yield	Oil, palm			
		Oil, palm fruit	hg/ha	170,532	Calculated data
Malaysia	Area harvested	Oil, palm			
		Oil, palm fruit	ha	4,689,321	Official data
	Production	Oil, palm	tonnes	19,667,016	Official data
		Oil, palm fruit	tonnes	96,066,760	Official data
	Yield	Oil, palm			
		Oil, palm fruit	hg/ha	204,863	Calculated data
Nigeria	Area harvested	Oil, palm			
		Oil, palm fruit	ha	3,031,661	FAO data based on imputation methodology
	Production	Oil, palm	tonnes	910,000	Unofficial figure
		Oil, palm fruit	tonnes	7,962,213	FAO data based on imputation methodology
	Yield	Oil, palm			
		Oil, palm fruit	hg/ha	26,264	Calculated data

Source: FAOSTAT, <http://www.fao.org/faostat/en/>

In the 1960s, Nigeria was the top producer and exporter of palm oil. Now, Nigeria has become a net importer of palm oil. Much of the demand is driven by increased household consumption due to increased income and changing patterns and demand from the primary food processing industry. According to a 2011 report by the Foundation for Partnership Initiatives in the Nigeria Delta,

<sup>100</sup> IDH, Dalberg, Cassava Industrialization in Nigeria Factsheet, <https://www.growafrica.com/resources/factsheet-cassava-industrialization-nigeria>.

<sup>101</sup> Global Palm Oil Production website, <http://www.globalpalmoilproduction.com/>.

though domestic production was almost 900,000 tonnes, the overall gap in Nigeria was estimated at between 150,000 and 300,000 tonnes for technical palm oil (TPO) and 200,000 tonnes of special palm oil (SPO). TPO demand is driven by household consumers, while SPO can be fractionated into refined bleached deodorized oil for industrial processing.<sup>102</sup> Agrimoney notes that Nigeria globally exported 150,000 tonnes of palm oil in the 1960s and now imports 500,000 tonnes annually.<sup>103</sup>

In 2015, along with rice, tomato, poultry amongst others, the Central Bank of Nigeria placed restrictions on the allocation of dollars for crude palm oil (CPO). The difficulty in sourcing for forex has increased business for domestic producers. However, with increased demand and insufficient supply, there is room for investments in the sector. Similar to other crops already considered, the oil palm sector faces a number of challenges affecting its productivity, competitiveness and potential. These include low production yields, a lack of adequate investments and incentives, inefficient processing techniques and an infrastructure deficit in the areas of energy and transportation. Security concerns in the Niger delta have also affected the production of palm oil.

### **Oil Palm Production**

Oil palm is mainly grown in the coastal belt and riverine belt of Nigeria. The main oil palm producing states are Cross River, Akwa-Ibom, Delta, Bayelsa, Rivers, Anambra, Enugu, Imo, Abia, Ekiti, Ondo, Oyo, Edo and Ogun.<sup>104</sup> Smallholder farmers account for more than 90% of crude palm oil production. The Niger Delta accounts for 57% of total Nigerian oil palm production. Production is dominated by the collection of palm fruit from wild groves. Private plantations and large corporate and government-owned plantations also contribute to production. Reports state that Nigeria's oil palm plantation is estimated at between 169,000 hectares and 360,000 hectares.<sup>105</sup> Okomu Oil and Presco, the largest commercial producers, account for just 7% of total crude palm oil production.<sup>106</sup>

To increase production, investments are needed for planting and upgrading varieties of palm plantations with higher oil content varieties. These include investments in sprouted seeds and seedlings of high yield quality, fertilisers and farming practices. A 2011 study by the Department of Agricultural Extension and Rural Development showed that farmers often purchased adulterated seedlings, which reduced yields.<sup>107</sup>

---

<sup>102</sup> Foundation for Partnership Initiatives in the Nigeria Delta, A report on palm oil value chain analysis in the Niger Delta, 2011, <http://www.ndpifoundation.org/images/researchreports/reports/Palm-Oil-Value-Chain-Analysis.pdf>.

<sup>103</sup> Tanya Ashreena, Nigeria makes progress in releasing 'untapped potential' in palm oil, *Agrimoney*, 5 October 2016, <http://www.agrimoney.com/feature/nigeria-makes-progress-in-releasing-untapped-potential-in-palm-oil--466.html>.

<sup>104</sup> Foraminefera, Palm Oil and Palm kernel Nut Production in Nigeria: The Opportunities, <https://www.foramfera.com/palm-oil-and-palm-kernel-nut-production-in-nigeria-the-opportunities/>.

<sup>105</sup> Foundation for Partnership Initiatives in the Nigeria Delta, A report on palm oil value chain analysis in the Niger Delta, 2011, <http://www.ndpifoundation.org/images/researchreports/reports/Palm-Oil-Value-Chain-Analysis.pdf>.

<sup>106</sup> FBN Quest, Nigerian Palm Oil Sector: still a promising growth story, 4 October 2016.

<sup>107</sup> FBN Quest, Nigerian Palm Oil Sector: still a promising growth story, 4 October 2016.

Another factor affecting productivity, is the country's land tenure system. The land tenure system is a limiting factor in the private sector taking part in oil palm production. In order to increase productivity, the land tenure system in the country needs to be examined. Local and state governments have been called on to provide land for oil palm cultivation. However, it is important to note that oil palm plantations have environmental and social consequences which must be carefully considered by potential investors and governments.<sup>108</sup> Stakeholders in this sector have called for the privatization of state-owned plantations, which are underexploited, before investments for expansion into virgin land.<sup>109</sup> It is not uncommon to see big companies engaged in the oil palm sector affirming a commitment to long-term sustainable supply of palm oil.

Backward integration by a number of companies is driving the production of palm oil. Presco plc, a subsidiary of the Siat Group, has 17,000 hectares of palm plantation with plans to acquire more. Production is expected to grow through increased planted areas and improved yields that use modern planting materials.<sup>110</sup> Okomu Oil Palm Company Limited has 8,800 hectares of mature palm and a palm oil mill with a capacity of 30 tonnes per hour.<sup>111</sup> The 2016 FBN Quest on oil palm production in Nigeria notes that Okomu cleared 4,000 hectares of land with plans for more.<sup>112</sup>

PZ Wilmar, a joint venture between Wilmar International and PZ Cussons, signed a memorandum of understanding with the Nigeria Institute of Oil Palm Research to boost palm oil production in Nigeria.<sup>113</sup> The JV has a refinery in Lagos, Nigeria, which can process up to 1,000 metric tonnes of crude palm oil daily. According to PZ Cussons strategic report 2016, local agriculture is being supported through the development of over 26,500 hectares of land into palm plantations in Cross Rivers state. It has also acquired 12,800 from Obasanjo farms. PZ Wilmar hopes to grow 50,000 hectares of oil palm with the objective of making Nigeria a global leader in oil palm, utilizing Nigeria's competitive and comparative advantage.

Dufil Prima Foods PLC, a Tolaram Group brand and joint venture with the Salim Group involved in the fast-moving consumer goods (FMCG) segment, has also embarked on backward integration for palm oil. The company established a palm tree plantation under the Edo State Government Agribusiness revolution scheme. The company acquired and signed a memorandum of understanding with the Edo State government for the cultivation of 60,000 hectares of oil palm.<sup>114</sup>

Despite the involvement of these big players in palm oil production in Nigeria, there is still room for more investments. Demand is huge and far outstrips supply. A study suggests an investment of N2 trillion (approximately \$5.5 billion) is needed over the next 20 years for Nigeria to achieve

---

<sup>108</sup> World Rainforest Movement, Oil Palm in Nigeria: shifting from smallholders and women to mass production, 30 December 2010, <http://wrm.org.uy/articles-from-the-wrm-bulletin/section2/oil-palm-in-nigeria-shifting-from-smallholders-and-women-to-mass-production/>.

<sup>109</sup> Foundation for Partnership Initiatives in the Nigeria Delta, A report on palm oil value chain analysis in the Niger Delta, 2011, <http://www.ndpfoundation.org/images/researchreports/reports/Palm-Oil-Value-Chain-Analysis.pdf>.

<sup>110</sup> Presco website, <http://www.presco-plc.com/future-investments/>.

<sup>111</sup> Okomu Oil Palm Company Limited website, <http://www.okomunigeria.com/about>.

<sup>112</sup> FBN Quest, Nigerian Palm Oil Sector: still a promising growth story, 4 October 2016.

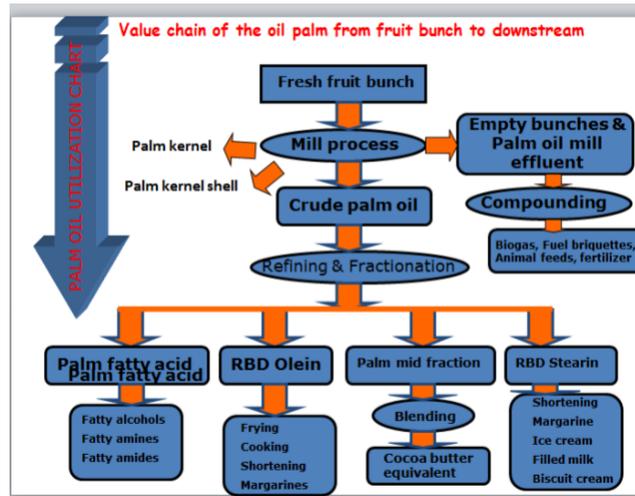
<sup>113</sup> Punch, NIFOR, PZ Wilmar sign MOU to boost oil palm production, *Punch*, 9 September 2016, <http://punchng.com/nifor-pz-wilmar-sign-mou-boost-oil-palm-production/>.

<sup>114</sup> Femi Adekoya, Nigeria's path to revamping oil palm sector, *Guardian*, 22 April, 2015, <https://guardian.ng/business-services/industry/nigerias-path-to-revamping-oil-palm-sector/>.

self-sufficiency in oil palm production.<sup>115</sup> With the Nigerian government looking to export palm oil and take the number 1 spot it had 30 or so years ago, oil palm investment in Nigeria should be considered.

### Oil Palm Processing

Oil palm processing is useful for the food and non-food industries. To produce good quality crude palm oil and palm kernel, fresh fruit bunches are milled within 24 hours of harvesting.<sup>116</sup> Crude palm oil can become either TPO or SPO, based on the mode of processing and the quantity of free fatty acid. Small scale farmers tend to process TPO as they harvest the fresh fruit and leave it to ferment. In order to get SPO and quality grade oil for industrial use, the fresh fruits have to be processed soon after harvesting.<sup>117</sup> The palm kernel nut is crushed and can be further processed into palm kernel oil.



Source: Omorefe Asemota, NIFOR powerpoint

Crude palm oil and palm kernel oil can be used for non-food industries such as soap manufacturing, candles, bio fuel and food industries as oil-based food ingredients, including margarine, ghee, and shortening. Crude palm oil can also be processed into derivative products such as fatty acid, refined, bleached and deodorized (RBD) olein and stearin, as indicated in the figure above. There is huge potential for palm oil processing in the country. In 2013, it was reported that the noodle industry consumed approximately 72,000 metric tonnes of RBD palm oil. The palm oil was

<sup>115</sup> Sahel Capital, Unlocking the Palm Oil Potential in West Africa, Vol 10, March 2015, <http://sahelcp.com/wp-content/uploads/2016/12/Sahel-Newsletter-Volume-10.pdf>.

<sup>116</sup> Wilmar, Tropical Oils, <http://www.wilmar-international.com/our-business/tropical-oils/plantations/>.

<sup>117</sup> Punch, It's shameful Nigeria imports palm oil – Aladewolu, 10 December 2016, <http://punchng.com/shameful-nigeria-imports-palm-oil-aladewolu/>.

primarily imported because local palm oil companies were unable to fulfil industry requirements.<sup>118</sup>

Palm kernel cakes, derived from the solid residue after palm kernel oil extraction, can be used for animal feed. According to a 2013 report in the *Nation* newspaper, palm kernel oil and cake are in high demand for local consumption and exports. There is also a wide supply gap for domestic and industrial purposes.<sup>119</sup>

Investors could therefore consider investing in a palm kernel oil plant with required processing equipment, such as a nut cracking unit, a crushing plant, screw press, bucket elevator and main shaft elevator. As has been seen with other sectors of the agribusiness, investors should also pay attention to possible sources of raw materials and market access.

Overall, most of Nigeria's palm oil production is done on a small scale of between 1-5 tonnes per day. The estimated size of the local market around 2012 was put at N3 billion (approximately US\$8.2 million) for palm oil, N4.24 billion (approximately US\$11.5 million) for palm kernel oil and N3.3 billion (approximately US\$9 million) for palm kernel cake.<sup>120</sup> The market size is increasing. Nigeria's 2016/2017 palm oil consumption is estimated at 1.53 million metric tonnes, an increase from the 2012/2013 figure of 1.45 million metric tonnes.<sup>121</sup>

### **Organic Agriculture and Fertilizers**

Nigeria does not produce much organic produce, although there is much potential. According to a 2016 survey by the Research Institute of Organic Agriculture (FiBL), in 2014, Africa had 1.3 million hectares or 3% of organic agricultural land out of the 43.7 million hectares worldwide. The East African countries - Uganda, Tanzania and Ethiopia - were on the list of top ten countries with the largest numbers of organic producers in 2014. Uganda was second in the world with 190,552 producers. Tanzania and Ethiopia (2013 figures) were the 5<sup>th</sup> and 6<sup>th</sup> largest producers with 148,610 and 135,827 producers respectively. 26% of organic producers are located in Africa, with Asia accounting for the most, i.e. 40%.<sup>122</sup>

The global organic market size is valued at \$80 billion, up from \$15.2 billion in 1999. Africa with its many smallholder farmers who use traditional methods to grow crops without much chemical pesticides or synthetic fertilizers, can benefit from this global organic market. Indeed, this is a reason given for Uganda's success in organic production. Uganda, a landlocked country with a population of 39 million and GDP of \$26.37 billion, is Africa's largest producer and exporter of organic products. In 2013, Uganda had 350,000 hectares of land under organic farming, accounting

---

<sup>118</sup> Nkiruka Nnorom, Imposition of 35 Percent Import Duty on CPO Detrimental to Industries, *Vanguard*, 19 May 2013.

<sup>119</sup> Edwin Agbaiké, Palm Kernel Oil and Cake Processing, *Nation Online*, 13 November 2013, <http://thenationonline.net/palm-kernel-oil-cake-processing/>.

<sup>120</sup> Foraminfera Market Research, Processing of Fresh Fruit Bunch to Yield Palm Oil, Palm Kernel Oil and cake in Nigeria: A Viable Business, <https://www.foramfera.com/processing-of-fresh-fruit-bunch-ffb-to-yield-palm-oil-palm-kernel-oil-and-cake-in-nigeria-a-viable-business/>.

<sup>121</sup> Statista, Palm oil consumption in Nigeria from 2011 to 2016/2017 (in 1,000 metric tonnes), <https://www.statista.com/statistics/489451/palm-oil-consumption-nigeria/>.

<sup>122</sup> Helga Willer and Julia Lernoud, Organic Agriculture Worldwide 2016: Current Statistics, FiBL and IFOAM, 2016, <http://orgprints.org/29790/13/willer-lernoud-2016-global-data-biofach.pdf>.

for more than 2% of agricultural land with over 400,000 internationally certified organic farms. Uganda recorded a turnover of more than \$37 million, with demands for organic produce up to \$600 million.<sup>123</sup>

Nigeria, with a population of more than 4 times that of Uganda and so much agricultural potential, has not fared half as well as Uganda. Nigeria needs to aggressively pursue organic agriculture. The government of Nigeria and the private sector need to prioritize organic agriculture. Nevertheless, Nigeria appears to be slowly adopting organic farming, albeit this is still in its infancy. In 2007, Nigeria had 3,154 hectares under organic agriculture with 59 hectares fully converted and managed by a few farmers and non-governmental organisations. This has increased to 8,202 hectares of organic land by 2009 and 11,979 hectares with 517 producers by 2010.<sup>124</sup>

Organic farming in Nigeria has much potential. Domestically, the Nigerian market appears ready for organic products. Indeed, some smallholder farmers use some organic farming methods, such as crop rotation, shifting cultivation, animal manure and natural pest control, in their agricultural farming. These methods help ensure environmental conservation, increases soil fertility, prevents soil erosion, and encourages nutritious and good quality produce. Although organic farming has many economic, environmental and social benefits, many Nigerian farmers still practice conventional farming.

Organic farmers in Nigeria face a number of constraints. According to the 2014 USDA GAIN report on organic farming in Nigeria, challenges include a lack of awareness, output marketing problems, inadequate supporting infrastructure, low production rates, high input costs, the non-availability of farm-inputs, lack of appropriate agriculture policy, lack of financial support, and the inability to meet export demand, amongst others.<sup>125</sup> Technical knowhow, market access, government support and the availability of organic fertilizers at affordable prices are needed to help the sector reach its potential. Areas investors may want to focus on including training and education of smallholder farmers, supply of inputs, innovation, marketing and distribution and partnerships.

One critical area in dire need of investments in Nigeria is the production and supply of fertilizers, including organic fertilizers. Generally, Nigeria's fertilizer consumption is low, with figures less than 10 kilograms per hectare per annum as compared to 200 kilograms in Europe and 140 in Bangladesh.<sup>126</sup> In Nigeria, there is an increased awareness of the benefits of organic fertilizer. Organic fertilisers are even considered the best alternative to inorganic fertilizer by Nigerian agriculture stakeholders. Other areas requiring investment in the organic fertilizer value chain include education, training, technical assistance and certification.

Nigeria's huge market potential for organic fertilizers and bulk market is yet to be fully developed. Should the potential in this sector be utilized, Nigeria can actually spend less per ton on acquiring

---

<sup>123</sup> Ruth Olurounbi, EOA: Securing Nigeria through organic agric, Nigerian Tribune, 19 December 2016, <http://tribuneonlineng.com/ea-securing-nigeria-organic-agric/>.

<sup>124</sup> AgroNigeria, Can Critics of GMO in Nigeria Find Solace in Organic Farming, 10 November 2016; <https://agronigeria.com.ng/can-critics-gmos-nigeria-find-solace-organic-farming/>.

<sup>125</sup> USDA, Global Agricultural Information Network, Nigeria: Organic Agriculture in Nigeria, 6 May 2014, [https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Organic%20Agriculture%20in%20Nigeria\\_Lagos\\_Nigeria\\_6-5-2014.pdf](https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Organic%20Agriculture%20in%20Nigeria_Lagos_Nigeria_6-5-2014.pdf).

<sup>126</sup> Ahmed Dio Agbo, Daily Trust, Organic Farming – Is Nigeria Lagging Behind? Daily Trust, 9 May 2014, <https://www.dailytrust.com.ng/daily/agriculture/23495-organic-farming-is-nigeria-lagging-behind>.

quality, effective, locally manufactured, and environmentally-friendly fertilizer.<sup>127</sup> There are developments in the area now in Nigeria. Bio/organic fertilizer has been incorporated into the Nigerian national fertilizer policy and organic fertilizers are included in the 2014 Growth Enhancement Support Scheme (GES) under the ATA. In January 2017, the *Nigerian Tribune* newspaper reported that at least 31 organic fertilizer companies operating in Nigeria are involved in GES.<sup>128</sup>

Private sector investments in the organic fertilizer sector include producers and suppliers. Organic fertilizer producers in Nigeria include EarthCare Nigeria Limited, and Environmental Pollution Science and Technology Limited (ENPOST). EarthCare is the largest commercial producer of organic fertilizer, a joint venture initiative of the United States between EarthCare Nigeria Limited and EarthCare Technologies Inc. The EarthCare Plant is situated in Ikorodu, Lagos State. It has the capacity to produce 200,000 metric tonnes of organic fertilizer.<sup>129</sup> ENPOST is an ecotourism biodiversity centre that provides agricultural and environmental education and research activities.<sup>130</sup> A number of organic fertilizer suppliers in Nigeria have recently been launched. These include Greenfelt organic fertilizer from Netherlands and Nano organic fertilizer from Thailand.<sup>131</sup>

## Conclusion

Nigeria's potential for the agribusiness industry is good and largely untapped. The country's large consumer market and huge population creates a real demand for food and food processing. This demand creates huge opportunities for investments. The availability of land, raw materials, affordable labour, and export potential also create investment opportunities. The Nigerian government's increasing perception of the value in agriculture as a business and efforts to diversify the economy through agriculture, strengthen the agribusiness industry's potential.

In particular, rice, tomato, poultry (chicken and eggs), palm oil, fruit juice, mixed nuts (cashew and peanuts), cassava and organic fertilizer are agriculture products that provide Nigeria with a comparative advantage. The government is partnering with private sector to develop the value chain of these products. With private sector investments to boost local production and strengthen processing capacities, as well as government support and a business enabling environment, Nigeria's agribusiness has the potential for increased growth levels and profitability.

Across the products examined in this report, investments pertaining to increasing land cultivation areas, improving yields, training for smallholder farmers, machinery and equipment, transport and logistics, storage, and processing are needed. Processing and value add to products such as tomato, cassava, eggs, fruits and oil palm will positively impact Nigeria's food security concerns, giving

---

<sup>127</sup> Olubukola Oluranti Babalola, Matthew Olusoji Ilori and S.A Adegbite, Engineering Economic Analysis of Organic Fertilizer Production in Nigeria, *International Journal of Engineering Research and Technology*, Vol 1 – Issue 9 (November 2012).

<sup>128</sup> Sam Nwaoko, organic agric: As Advocacy for organic farm markets heighten in Nigeria, *Nigerian Tribune*, 10 January 2017, <http://tribuneonline.com/organic-agric-advocacy-organic-farm-markets-heightens-nigeria/>.

<sup>129</sup> Earthcare Website, <http://www.earthcarecompostplus.com/about.html>.

<sup>130</sup> ENPOST website, <http://enpostng.com/>.

<sup>131</sup> Sahel Standard, Nigerian Farmers Urged to Embrace Organic Fertilizer, 4 February 2017, <http://sahelstandard.com/index.php/2017/02/04/farmers-charged-on-use-of-organic-fertilizer/>.



investors good returns. However, investors should be prepared to be involved in backward integration to guarantee the supply of raw products for processing.

There is also the need to address the challenges hampering growth in the sector. Challenges such as constraints to land access, low levels of irrigation, limited agricultural research, high cost of farm inputs, availability and affordability of fertilizer, market access, post-harvest loss, infrastructure deficit and inadequate storage and processing facilities require investment and innovative ideas. While investors are beginning to participate actively in these areas, there is still room for more investors to come on board.

Private sector support in the form of import bans for products such as poultry, eggs (excluding hatching eggs) and fruit juice in retail packs and foreign exchange access for the import of products such as rice, tomato, poultry (chicken and eggs) and palm kernel and palm oil products, are incentives for investors to develop domestic production and manufacturing of agriculture products. Smuggling and corruption are vices that the government must deal with more effectively to truly incentivize investment and ensure domestic productivity.

Overall, investors should consider the opportunities and challenges present in the Nigerian agribusiness sector. Investors should further seek to convert challenges into opportunities. By investing in Nigeria' agribusiness, specifically in areas with high growth potential and/or that the government has identified as priority for growth, the prudent investor has the best chance of reaping bountiful rewards.

*The author, Dr Adefolake Adeyeye, is a Research Fellow of the NTU-SBF Centre for African Studies, a trilateral platform for government, business and academia to promote knowledge and expertise on Africa, established by Nanyang Technological University and the Singapore Business Federation. Dr Adeyeye can be reached at [adefolake.adeyeye@ntu.edu.sg](mailto:adefolake.adeyeye@ntu.edu.sg).*

## Selected Bibliography

Abubakar Salihi and Agbo-Paul Augustine. 2013. The Great Tomato Waste...Nationwide. *Leadership*, 7 September 2013.

Ada Osakwe. 2015. Private Investment Can Unlock Africa's Agricultural Potential: the role of the private sector is critical in adding value to Africa's agricultural produce through processing. *African Business*, November 2015, Issue 424.

Agrolay website, <https://www.agrolay.com/>

AgroNigeria. 2016. Can Critics of GMO in Nigeria Find Solace in Organic Farming. 10 November 2016. <https://agronigeria.com.ng/can-critics-gmos-nigeria-find-solace-organic-farming/>.

AgroNigeria. 2014. Rice farming: What You Need to Know. 10 January 2014. <https://agronigeria.com.ng/rice-farming-what-you-need-to-know/>.

Agritrade. 2015. Rice Value chain/Nigeria: Olam boosts Nigeria's rice supply with local brand. 20 April 2015. <http://agritrade.cta.int/Agriculture/Commodities/Rice/Rice-value-chain-Nigeria-Olam-boosts-Nigeria-s-rice-supply-with-local-brand>.

Ahmed Dio Agbo. 2014. Daily Trust, Organic Farming – Is Nigeria Lagging Behind? *Daily Trust*, 9 May 2014. <https://www.dailytrust.com.ng/daily/agriculture/23495-organic-farming-is-nigeria-lagging-behind>.

Aishat Onus. No Contract Awarded on Egg Production. *FMARD*, 24 July 2016. <http://fmard.gov.ng/no-contract-awarded-on-egg-production/>.

Akin George. 2015. CBN Forex Restrictions – Relevance, Importance, *Daily Independent*, 20 July 2015. <http://independent.ng/cbn-forex-restrictions-relevance-implications/>.

Answer Industries Limited Website. <http://answerindustriesltd.com.ng/aboutus.php>.

Avangardco Website. <http://avangardco.ua/en/investor-relations/nasha-kompanija/>.

Brian Handwerk. 2012. Uganda's Household Farmers Become Organic Exporters. *National Geographic Voices*, 21 June 2012. <http://voices.nationalgeographic.com/2012/06/21/ugandas-household-farmers-become-organic-exporters/>.

BBC News 2017. Why does Nigeria import so much rice, 2 February 2017. <http://www.bbc.com/news/world-africa-38795673>.

Building Trust for Trade. NQIP Brochure, <https://www.nqi-nigeria.org/home/48>

Businessday online. 2017. Nigeria, biggest cassava producer, imports 95% of starch. 21 February 2017. <https://www.businessdayonline.com/nigeria-biggest-cassava-producer-imports-95-starch/>.

Caleb Ojeale. 2016. \$51 billion potential seen in cassava value chain (Nigeria). *BusinessDay*, 19 May 2016. <https://asokoinsight.com/news/51-billion-potential-seen-cassava-value-chain-nigeria>.

Cassava Millers. nd. The staple crop processing zone takes off with cassava in Kogi state. Undated. <http://cassavamillers.com/studies-and-papers/the-staple-crop-processing-zones-scpzs-takes-off-with-cassava-in-kogi-state>.

Chika Izuora. 2017. Nigeria: Cassava, Sorghum Bread Initiative to Save Nigeria \$3.5 Billion Annually. *Leadership*, 25 May 2017. <http://leadership.ng/2017/05/25/cassava-sorghum-bread-initiative-save-nigeria-3-5bn-annually/>.

C:AVA. Nigeria: country overview. <http://cava.nri.org/focus-countries/nigeria/country-overview>.

C:AVA II. <http://cavaiiproject.blogspot.sg/2015/07/>.

Charity Ugonna, M.A Jolaoso and Peter Onwualu. 2015. Tomato Value Chain in Nigeria: Issues, Challenges and Strategies. *Journal of Scientific Research and Reports*, 7(7): 501 – 515, June 2015.

CBI. 2016. Exporting Cashew Nuts to Europe. 7 December 2016. <https://www.cbi.eu/node/2610/pdf/>.

Chikodi Okereocha. 2016. The race for huge rice farms. *The Nation*, 20 May 2016. <http://thenationonlineng.net/race-huge-rice-farms-2/>.

Chris Stein. 2016. Currency controls force Nigerian manufacturers to buy locally. *Financial Times*, 27 November 2016. <https://www.ft.com/content/160b19a4-8978-11e6-8cb7-e7ada1d123b1>.

Coca-Cola Company. 2016. The Coca-Cola company and TGI Group announce strategic investment in Nigeria's Chi Limited. 30 January 2016. <http://www.coca-colacompany.com/press-center/press-releases/the-coca-cola-company-and-tgi-group-announce-strategic-investment-in-nigerias-chi-limited>.

Crusoe Osagie/ 2015. Local Farmers to Add 2.9m metric tonnes to Nigeria's rice stock, 24 February 2015. <http://allafrica.com/stories/201502241138.html>.

Development Finance Department, Central Bank of Nigeria. 2016. Anchor Borrowers' Programme Guidelines, December 2016, <https://www.cbn.gov.ng/Out/2017/DFD/Anchor%20Borrowers%20Programme%20Guidelines%20-DEC%20%202016.pdf>.

Earthcare Website. <http://www.earthcarecompostplus.com/about.html>.

Edwin Agbaike. 2013. Palm Kernel Oil and Cake Processing. *Nation Online*, 13 November 2013. <http://thenationonlineng.net/palm-kernel-oil-cake-processing/>.

Egufe Yafugborhi. 2016. How Tomato Cultivation is taking root in Delta. *Vanguard*, 6 January 2016. <http://www.vanguardngr.com/2016/01/how-tomato-cultivation-is-taking-root-in-delta/>.

ENPOST website. <http://enpostng.com/>.

Eromosele Abiodun. 2016. Foreign Exchange Restrictions – Manufacturers Decry Scarcity of Raw Materials. *This Day Live*, 11 January 2016. <http://www.nigeriamanufacturingexpo.com/This-Day-Live-Foreign-Exchange-Restrictions-Manufacturers-Decry-Scarcity-of-Raw-Materials>.

Euromonitor International. 2017. Juice in Nigeria, March 2017, <http://www.euromonitor.com/juice-in-nigeria/report>.

Fabian Odum and Paul Adunwole. 2015. Honeywell Oils Cassava-Wheat Flour Production Line. *The Guardian*, 17 January 2015. <https://guardian.ng/features/agro-care/honeywell-oils-cassava-wheat-flour-production-line/>.

FactFish, Geography and Agriculture. <http://www.factfish.com/catalog/crop>.

Fadekemi Ajakaiye. 2017. Stallion farms Lauds Buhari Agri-Business Agenda, Promises Increased Rice Yields, *This Day*, 8 April 2017. <https://www.thisdaylive.com/index.php/2017/04/08/stallion-farms-lauds-buhari-agri-business-agenda-promises-increased-rice-yield/>.

FBN Quest. 2016. Nigerian Palm Oil Sector: Still a promising growth story, 4 October 2016.

Federal Ministry of Agriculture and Rural Development. 2016. Nigeria Agriculture Policy Roadmap (Green Alternative), 15 June 2016. <http://fmard.gov.ng/wp-content/uploads/2016/03/2016-Nigeria-Agric-Sector-Policy-Roadmap-June-15-2016-Final.pdf>.

Federal Ministry of Budget and National Planning. Nigeria Economic Recovery and Growth Plan, 2017-2020. <http://www.nationalplanning.gov.ng/index.php/news-media/news/current-news/780-federal-republic-of-nigeria-economic-recovery-growth-plan-2017-2020>.

Federal Ministry of Agriculture and Rural Development. The Green Alternative: Building on the successes of ATA. <http://fmard.gov.ng/the-green-alternative/>.

Femi Adekoya. 2017. BUA upgrades rice mill to meet one million tonnes processing target. *The Guardian*, 8 February 2017. <https://guardian.ng/business-services/bua-upgrades-rice-mill-to-meet-one-million-tonnes-processing-target/>.

Femi Adekoya. 2016. Erisco to increase tomato-processing capacity new technology. *The Guardian*, 20 July 2016. <https://guardian.ng/business-services/erisco-to-increase-tomato-processing-capacity-with-new-technology/>.

Femi Adekoya. 2016. Springfield Agro invests N200 million to revive to revive tomato plant. *The Guardian*, 8 March 2016. <https://guardian.ng/business-services/springfield-agro-invests-n200-million-to-revive-tomato-plant/>.

Femi Adekoya. 2015. Nigeria's path to revamping oil palm sector. *The Guardian*, 22 April 2015. <https://guardian.ng/business-services/industry/nigerias-path-to-revamping-oil-palm-sector/>.

Food and Agriculture Organization of the United Nations. 2008. Animal production and Health Division, Nigeria: Poultry sector country review, July 2008 re-edit. <ftp://ftp.fao.org/docrep/fao/011/ai352e/ai352e00.pdf>.

Food and Agriculture Organization of the United Nations. 2017. A Cassava Industrial Revolution in Nigeria, [http://www.iita.org/wp-content/uploads/2017/The\\_Cassava\\_Monitoring\\_Survey\\_in\\_Nigeria.pdf](http://www.iita.org/wp-content/uploads/2017/The_Cassava_Monitoring_Survey_in_Nigeria.pdf).

Food and Agriculture Organization of the United Nations. 2004. Global Cassava Development Strategy, A cassava industrial revolution in Nigeria: The potential for a new industrial crop, 2004. <ftp://ftp.fao.org/docrep/fao/007/y5548e/y5548e00.pdf>.

Food and Agriculture Organization of the United Nations. 2008. Nigeria: Consultative Mission on Assessment of the Nigerian poultry market chain to improve biosecurity, November 2008. <http://www.fao.org/3/a-ak778e.pdf>.

Food and Agriculture Organization of the United Nations. Corporate Document Repository, Cassava Processing: Cassava starch and its uses. <http://www.fao.org/docrep/x5032e/x5032E06.HTM>.

Food and Agriculture Organization of the United Nations. 2013. Monitoring African Food and Agricultural Policies – Analysis of Incentives and Disincentives for Rice in Nigeria, July 2013. <http://www.fao.org/3/a-at581e.pdf>.

Food and Agriculture Organization of the United Nations. Nigeria at a glance, <http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/>.

Food and Agriculture Organization of the United Nations. 2016. Rice Market Monitor, Volume XIX Issue No. 1 April 2016. [http://www.fao.org/fileadmin/templates/est/COMM\\_MARKETS\\_MONITORING/Rice/Images/RMM/RMM\\_APR16.pdf](http://www.fao.org/fileadmin/templates/est/COMM_MARKETS_MONITORING/Rice/Images/RMM/RMM_APR16.pdf).

Food and Agriculture Organization of the United Nations. 2011. Save and Grow: A policymaker's guide to the sustainable intensification of smallholder crop production, 2011, Chapter 5. <http://www.fao.org/ag/save-and-grow/en/5/index.html>.

Food and Agriculture Organization of the United Nations. 2004. Small-Scale Poultry Production: technical guide, 2004, <http://www.fao.org/3/a-y5169e.pdf>.

Food Fortification Initiative. [http://ffinetwork.org/about/stay\\_informed/releases/images/Rice\\_Nigeria.pdf](http://ffinetwork.org/about/stay_informed/releases/images/Rice_Nigeria.pdf)

Foraminfera Market Research. Processing of Fresh Fruit Bunch to Yield Palm Oil, Palm Kernel Oil and cake in Nigeria: A Viable Business. <https://www.foramfera.com/processing-of-fresh-fruit-bunch-ffb-to-yield-palm-oil-palm-kernel-oil-and-cake-in-nigeria-a-viable-business/>.

Foraminefera, Market Research. Palm Oil and Palm Kernel Nut Production in Nigeria: The Opportunities. <https://www.foramfera.com/palm-oil-and-palm-kernel-nut-production-in-nigeria-the-opportunities/>.

Foundation for Partnership Initiatives in the Nigeria Delta. 2011. A report on palm oil value chain analysis in the Niger Delta, 2011. <http://www.ndpifoundation.org/images/researchreports/reports/Palm-Oil-Value-Chain-Analysis.pdf>.

Global Palm Oil Production website, <http://www.globalpalmoilproduction.com/>.

Godwin Ekosin. 2017. Nigerian farmers can now make fortunes as Nano Organic Liquid Fertilizer unveiled in Kaduna. *GoBroadsheet*, 25 January 2017. <http://gobroadsheet.com/index.php/2017/01/25/nigerian-farmers-can-now-make-fortunes-as-nano-organic-liquid-fertilizer-unveiled-in-kaduna/>.

Grow Africa. Ebony Agro Industries Ltd, <https://www.growafrica.com/fr/organizations/ebony-agro-industries-ltd>.

Grow Africa. Rice, <https://www.growafrica.com/groups/rice>.

Grow Africa. Stallion Nigeria Limited- Nigeria, <https://www.growafrica.com/groups/stallion-nigeria-limited-nigeria>.

Helga Willer and Julia Lernoud. 2016. Organic Agriculture Worldwide 2016: Current Statistics, FiBL and IFOAM, 2016. <http://orgprints.org/29790/13/willer-lernoud-2016-global-data-biofach.pdf>.

IDH, the sustainable trade initiative, Grow Africa and Dalberg Global Development Advisors, Market Opportunities for Commercial Cassava in Ghana, Mozambique and Nigeria, June 2015. <https://www.growafrica.com/resources/new-study-market-opportunities-commercial-cassava-grow-africa-secretariat-idh-and-dalberg>.

IDH, Dalberg, Cassava Industrialization in Nigeria Factsheet. <https://www.growafrica.com/resources/factsheet-cassava-industrialization-nigeria>.

IITA. 2017. The Cassava Monitoring Survey in Nigeria, February 2017. [http://www.iita.org/wp-content/uploads/2017/The\\_Cassava\\_Monitoring\\_Survey\\_in\\_Nigeria.pdf](http://www.iita.org/wp-content/uploads/2017/The_Cassava_Monitoring_Survey_in_Nigeria.pdf).

IITA. 2013. Nigeria releases improved cassava varieties to boost productivity, 14 January 2013. <http://www.iita.org/news-item/nigeria-releases-improved-cassava-varieties-boost-productivity/>.

Invest in Nigeria. 2017. Bank of Industry Trains Youth on Tomato Processing, 15 March 2017. <http://www.invest-nigeria.com/bank-industry-trains-youths-tomato-processing/>.

Keynote Address Delivered by the Honourable Minister of Agriculture and Rural Development, Chief Audu Ogbeh, OFR, at 2016 Cashew Festival, 29 February 2016. [http://ncan.org.ng/pubilation\\_details.php?tid=2&tg\\_id=4&pid=43&cid=1&pg>Aboutus.php](http://ncan.org.ng/pubilation_details.php?tid=2&tg_id=4&pid=43&cid=1&pg>Aboutus.php).

Kogi to revolutionize agriculture, *Vanguard*, 8 January 2017. <http://www.vanguardngr.com/2017/01/kogi-to-revolutionize-agriculture/>.

Lekan Tobe. Reducing Post-Harvest Loss in the Nigerian Tomato Value Chain. <https://www.pyxeraglobal.org/reducing-post-harvest-loss-nigerian-tomato-value-chain/>.

Maggie Fick. 2016. Coca-Cola buys stake in Nigerian juice and dairy company CHI, 30 January 2016. <https://www.ft.com/content/b9b54990-c668-11e5-b3b1-7b2481276e45?mhq5j=e3>.

Mark Hillsdon. 2016. The Unofficial 18<sup>th</sup> SDG? It's information: How technology can help tackle the mammoth task of measuring progress on the 17 global goals, *The Guardian*, 26 February 2016.

Marketing Edge. 2017. Chi fruit brand tops segment with 33% market share in 2016, 15 March 2017. <http://www.marketingedge.com.ng/2017/03/15/chi-fruit-juice-brands-top-segment-with-33-market-share-in-2016/>.

Mayuko Tani. 2016. Olam's chicken and egg investment in Nigeria, 12 April 2016. <http://olamgroup.com/news/olam-breaks-ground-nigerias-largest-integrated-animal-feed-mill-poultry-breeding-farms-hatchery-kaduna-state/#sthash.mjiLcC4R.dpbs>.

Mgbenka, Onwubuya and Ezeano. 2015. Organic Farming in Nigeria: Need for Popularization and Policy. *World Journal of Agricultural Sciences*, 11(6): 346-355, 2015. [https://www.idosi.org/wjas/wjas11\(6\)15/4.pdf](https://www.idosi.org/wjas/wjas11(6)15/4.pdf)

Mfonobong Nsehe. 2016. Africa's Richest Man Aliko Dangote Opens Tomato Processing Factory. *Forbes*, 17 March 2016. <https://www.forbes.com/sites/mfonobongnsehe/2016/03/17/africas-richest-man-aliko-dangote-opens-tomato-factory/#73e40bfb4015>.

Mustapha Muhammed. 2017. Pest destroys Aliko Dangote's tomato paste business. *Cape Times*, 19 May 2017. <https://www.pressreader.com/south-africa/cape-times/20170519/282007557326283>.

Naija247news. 2016. Nigerian farmers can tap into \$4bn global coconut market, 20 October 2016. <http://www.freshplaza.com/article/165420/Nigerian-farmers-can-tap-into-4bn-global-coconut-market>.

NAN. 2016. Coconut Tree might become extinct in Nigeria in 50 years. *The Sun*, 23 October 2016. <http://sunnewsonline.com/coconut-trees-might-become-extinct-in-nigeria-in-50-years/>.

NAN. 2016. Rice Mills employs 3,000 workers in Kebbi. *The Guardian*, 16 March 2016. <https://guardian.ng/news/rice-mills-employs-3000-workers-in-kebbi/>.

NCGA. 2016. Cassava can Inject 10 Trillion Naira Yearly Into the Economy. 20 September 2016. <http://ncgaonline.org/cassava-can-inject-10-trillion-naira-yearly-into-the-economy/>.

Nigeria: As 1.5 billion Tara rice Mills comes on Board. *The Guardian*, 10 January 2015. <http://allafrica.com/stories/201501120358.html>.

Nigeria: Dangote Group Invest heavily in Rice Production. *Africa News*, 15 February 2017. <http://www.africanews.com/2017/02/15/nigeria-dangote-group-invest-heavily-in-rice-production/>.

Nigeria: Full Text of Buhari's 2017 budget speech, 14 December 2016. <http://www.premiumtimesng.com/news/more-news/217949-full-text-buharis-2017-budget-speech.html>.

Nigeria: How to promote Food Processing as mega-revenue Earning Industry. *The Guardian*, 22 January 2015.

Nigeria: Nigerian Entrepreneur blazing a trail in agribusiness. *Africa News*, 6 January 2016. <http://www.africanews.com/2016/01/06/nigerian-entrepreneur-blazing-a-trail-in-agribusiness/>.

Nigeria Manufacturing Expo 2017. Food Processing and Packaging Market Report. [http://www.nigeriamanufacturingexpo.com/uploads/Pages/site160\\_33588\\_en\\_file1.pdf](http://www.nigeriamanufacturingexpo.com/uploads/Pages/site160_33588_en_file1.pdf).

Nigeria: Poultry Business in Nigeria and the threat of Avian Flu. *Agronews*, 8 February 2017. <http://agronewsng.com/news/poultry-business-in-nigeria-and-the-threat-of-avian-flu/>.

Niyi Egbe. 2017. Taking a cue from the Lake Rice Initiative. *This Day*, 24 January 2017. <https://www.thisdaylive.com/index.php/2017/01/24/taking-a-cue-from-the-lake-rice-initiative/>.

Nkiruka Nnorom. 2013. Imposition of 35 Percent Import Duty on CPO Detrimental to Industries. *Vanguard*, 19 May 2013.

NQIP. Directory of Testing and Calibration Directories in Nigeria, <https://labsapi.nqi-nigeria.org/docs/Directory%20of%20Testing%20and%20Calibration%20Laboratories%20in%20Nigeria%20v1.pdf>.

OECD-FAO Agricultural Outlook 2014-2023, *MEATS - OECD-FAO Agricultural Outlook 2014-2023*. <http://stats.oecd.org/index.aspx?queryid=58654>.

Okomu Oil Palm Company Limited website. <http://www.okomunigeria.com/about>.

Olam breaks ground on Nigeria's largest integrated animal feed mill, poultry breeding farms and hatchery in Kaduna State, 8 April 2016. <http://olamgroup.com/news/olam-breaks-ground-nigerias>

[largest-integrated-animal-feed-mill-poultry-breeding-farms-hatchery-kaduna-state/#sthash.mjiLcC4R.dpbs.](#)

Olubukola Oluranti Babalola, Matthew Olusoji Ilori and S.A Adegbite. 2012. Engineering Economic Analysis of Organic Fertilizer Production in Nigeria, International Journal of Engineering Research and Technology, Vol 1 – Issue 9, November 2012.

Oluyemisi Kuku-Shittu and Angga Pradesha. 2013. Paper presented at the 18<sup>th</sup> annual conference on Econometric Analysis and Policy Challenges in Africa, 24-26 July 2013. [http://www.aaawe.org/wp-content/uploads/2015/01/Yemisi\\_final.pdf](http://www.aaawe.org/wp-content/uploads/2015/01/Yemisi_final.pdf).

Oscarline Onwuemenyi. 2017. Why we set up Anchor Borrower programme – CBN, Sweet crude report, 6 January 2017. <http://sweetcrudereports.com/2017/01/06/why-we-set-up-anchors-borrowers-programme-cbn/>.

Paul Adoyi. 2013. Prospect, price and peril of poultry industry in Nigeria, 9 July 2013. <https://pauladoyi.wordpress.com/2013/07/09/prospect-price-and-peril-of-poultry-industry-in-nigeria/>.

Poultry Association of Nigeria. History of PAN. <http://www.poultryassociationng.com/index.php/about-pan/history-of-the-association>.

Nigeria spends \$2.4bn on rice importation. *Premium Times*, 28 July 2015. <http://www.premiumtimesng.com/business/187406-nigeria-spends-2-4bn-on-rice-importation-in-3-years-emefiele.html>.

Presco website. <http://www.presco-plc.com/future-investments/>.

President of the Federal Republic of Nigeria at the U.S-Africa Business Forum, New York, 21 September 2016. <http://allafrica.com/stories/201609220001.html>.

PwC. The World in 2050 – The long view: how will the global economic order change by 2050. <https://www.pwc.com/gx/en/world-2050/assets/pwc-the-world-in-2050-full-report-feb-2017.pdf>.

Punch. 2016. It's shameful Nigeria imports palm oil – Aladewolu. 10 December 2016. <http://punchng.com/shameful-nigeria-imports-palm-oil-aladewolu/>

Punch. 2016. NIFOR, PZ Wilmar sign MOU to boost oil palm production, 9 September 2016. <http://punchng.com/nifor-pz-wilmar-sign-mou-boost-oil-palm-production/>.

Pyrexa Global website, YieldWise. <https://www.pyxeraglobal.org/yieldwise/>.

Ringier Food. 2015. Nigeria's food and beverage industry sustains robust growth, 29 January 2015. <http://www.industrysourcing.com/article/nigeria%E2%80%99s-food-and-beverage-industry-sustains-robust-growth>.

Ruth Olurounbi. 2016. EOA: Securing Nigeria through organic agric. *Nigerian Tribune*, 19 December 2016. <http://tribuneonlineng.com/ea-securing-nigeria-organic-agric/>.

Sahel Capital. 2015. An assessment of the Nigerian Poultry Sector, June 2015. <http://sahelcp.com/wp-content/uploads/2016/12/Sahel-Newsletter-Volume-11.pdf>.

Sahel Capital. 2015. Rice in Nigeria: Industry Dynamics, October 2015. <http://sahelcp.com/wp-content/uploads/2016/12/Sahel-Newsletter-Volume-12.pdf>.

Sahel Capital. 2015. Unlocking the Palm Oil Potential in West Africa, Vol 10, March 2015. <http://sahelcp.com/wp-content/uploads/2016/12/Sahel-Newsletter-Volume-10.pdf>.

Sahel Capital. 2016. Cassava, A Staple Crop in Nigeria. <http://sahelcp.com/wp-content/uploads/2016/12/Sahel-Newsletter-Volume-13.pdf>.

Sahel Standard. 2017. Nigerian Farmers Urged to Embrace Organic Fertilizer, 4 February 2017. <http://sahelstandard.com/index.php/2017/02/04/farmers-charged-on-use-of-organic-fertilizer/>.

Sam Nwaoko. 2017. Organic Agric: As Advocacy for organic farm markets heighten in Nigeria. *Nigerian Tribune*, 10 January 2017. <http://tribuneonlineng.com/organic-agric-advocacy-organic-farm-markets-heightens-nigeria/>.

Solomon Elusoji. 2015. The March Towards Rice Self-Sufficiency, 14 March 2017. <https://www.thisdaylive.com/index.php/2017/03/14/the-march-towards-rice-self-sufficiency/>.

Standard Organisation of Nigeria, Laboratory Services. <http://son.gov.ng/laboratory-services/>.

Statista. Palm oil consumption in Nigeria from 2011 to 2016/2017 (in 1,000 metric tonnes). <https://www.statista.com/statistics/489451/palm-oil-consumption-nigeria/>.

Stine Rice. <http://www.stinerice.com/home>

Tanya Ashreena. 2016. Nigeria makes progress in releasing ‘untapped potential’ in palm oil. *Agrimoney*, 5 October 2016. <http://www.agrimoney.com/feature/nigeria-makes-progress-in-releasing-untapped-potential-in-palm-oil--466.html>.

Teagro. 2015. Transcorp Plc Agribusiness Arm Partners with Coca-Cola on New Five Alive Pulpy Orange Juice, 9 September 2015. [http://teragro-ng.com/site/?page\\_id=2272](http://teragro-ng.com/site/?page_id=2272).

Thai Farm International. <http://www.tfinigeria.com/profile.aspx>.

This Day Editorial. Nigeria: The Presidential Initiative on Cassava. *Africa News*, 24 October 2010. <http://allafrica.com/stories/201010250997.html>.

The Poultry Site. 2013. USDA International Egg and Poultry: Nigeria, 20 February 2013. <http://www.thepoultrysite.com/reports/?id=1596>.

The Poultry Site. 2014. Global Poultry Trends 2013 – Hen Egg Production in Africa and Oceania, 2 April 2014. <http://www.thepoultrysite.com/articles/3119/global-poultry-trends-2013-hen-egg-production-in-africa-and-oceania/>.

The Rockefeller Foundation. YieldWise: Reducing post-harvest food loss for African farmers. <https://www.rockefellerfoundation.org/our-work/initiatives/yieldwise/>.

TomatoJos Website. <http://www.tomatojos.net/the-team/>.

Union Dicon Slat Plc, UDS Plc continues implementation of transformation strategy, 8 April 2016. [http://udsplc.com/images/UDS\\_Bulletin\\_April\\_2016.pdf](http://udsplc.com/images/UDS_Bulletin_April_2016.pdf).

Tunji AKande. An Overview of the Nigerian Rice Economy. <http://unep.ch/etu/etp/events/agriculture/nigeria.pdf>.

UNAAB. Rice transformation proposal, <https://www.unaab.edu.ng/attachments/Current%20Rice%20Proposal.pdf>.

United Nations, Department of Economic and Social Affairs, Population Division. 2017. *World Population Prospects: The 2017 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP/248.

USDA, Global Agricultural Information Network. 2013. Nigeria: Food Processing Ingredients, 20 November 2013, [https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Processing%20Ingredients/Lagos\\_Nigeria\\_11-20-2013.pdf](https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Processing%20Ingredients/Lagos_Nigeria_11-20-2013.pdf).

Vanguard. 2015. Central Bank's Forex Restriction. *Vanguard*, 3 July 2015. <http://www.vanguardngr.com/2015/07/central-banks-forex-restrictions/>.

Vanguard. 2016. Nigeria imports N165bn fruit juice annually – MAN. *Vanguard*, 30 April 2016. <http://www.vanguardngr.com/2016/04/nigeria-imports-n165bn-fruit-juice-annually-man/>.

Vanguard. 2017. Tomato farmers in Kano state lost N2 billion in 2016, says commissioner. *Vanguard*, 15 March 2017. <http://www.vanguardngr.com/2017/03/pest-tomato-farmers-kano-state-lost-n2bn-2016-says-commissioner/>.

Vincent Yusuf and Ibrahim Musa Giginyu. 2015. An egg a day will hatch N620bn for Nigeria Annually. *Daily Trust*, 14 October 2015. <https://www.dailytrust.com.ng/news/agriculture/an-egg-a-day-will-hatch-n620bn-for-nigeria-annually/115056.html>.

VOA. Nigeria's rice boom raises output but old problems exist. 9 March 2017. <http://www.voanews.com/a/nigerian-rice-boom-raises-output-but-old-problems-persist/3757129.html>.

Wilmar. Tropical Oils, <http://www.wilmar-international.com/our-business/tropical-oils/plantations/>.

World Bank. 2013. Unlocking Africa's Agricultural Potential. Africa Region Sustainable Development Series. <https://openknowledge.worldbank.org/handle/10986/16624>.

World Rainforest Movement. 2010. Oil Palm in Nigeria: shifting from smallholders and women to mass production. 30 December 2010. <http://wrm.org.uy/articles-from-the-wrm-bulletin/section2/oil-palm-in-nigeria-shifting-from-smallholders-and-women-to-mass-production/>.

Yomi Kazeem. 2016. A tomato blight has caused a state of emergency in Northern Nigeria. *Quartz Africa*, 26 May 2016. <https://qz.com/692810/a-south-american-tomato-moth-is-stoking-food-security-fears-in-nigeria/>.