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Introduction

The Nigerian agricultural landscape is changing, with increased government policies aimed at stimulating private sector involvement and boosting local production of key products. In line with the diversification drive of the current administration as well as in fulfilment of one of its cardinal pillars of food security, it is expected that the government will continue to prioritise activities within the Agriculture sector through targeted policies to attract investments.

Globally, rice is a staple food to over 50% of people, providing over 19% of global human per capita energy. Human consumption accounts for about 78% of global production while the balance serves other uses such as feed.

Rice is one of the major staple foods in Nigeria, consumed across all geo-political zones and socio-economic classes in Nigeria. Only about 57% of the 6.7 million metric tonnes of rice consumed in Nigeria annually is locally produced, leading to a supply deficit of about 3 million metric tonnes.

With rapid growth in the country’s population which is estimated to exceed 200 million by 2019, it is expected that the demand for rice will be sustained and increased in the foreseeable future.

In this document we present an analysis of the rice industry and the tremendous opportunities across the various value chains.
Nigerian Agriculture Sector - Overview

Snapshot of Agriculture in Nigeria
Agriculture contributed an average of 24% to Real GDP over the period of 2012 and 2018

Crop production covers the production of cash crops (Cocoa, Rubber, etc) as well as staple foods (Rice, Maize, Cassava, etc). This sub-sector is the major driver of agricultural sector output; contributing an average of 90% to the total agricultural sector output between 2012 and 2018, growing at a CAGR of 3.6% over the same period.

Livestock/Animal production covers the rearing and sale of animals and animal derivatives (animal products) for consumption. Over the past period 2012 – 2018, livestock production has grown at a CAGR of 4.4% and accounted for an average annual contribution of 7% to the entire agricultural sector output.

Fishery includes activities aimed at rearing fish and other aquatic animals. The subsector accounted for an average of 2% of the annual agricultural sector output and grew at a CAGR of 4.4% between 2012 and 2018.

Forestry entails the legal planting and felling of trees. This sub-sector has contributed an average of 1% to the entire sector output; and grown at a CAGR of 4.0% between 2012 and 2018.

Fragmenting the sector...
Agriculture sub-sector composition, 2012 – 2018
Nigerian Agriculture Sector - Value Chain

**High-level Industry Value Chain**

### Resource Requirements/Activities

#### Production
- **Input:**
  - Financing
  - Land
  - Seeds/Fodder/Feed
  - Agrochemicals
  - Machinery
- **Activities:**
  - Genetics/Genetic modifications
  - Planting/Cultivation
  - Irrigation
  - Animal health and nutrition

#### Processing
- **Resource Requirements:**
  - Storage facilities
  - Processing technology
  - Preservation/Packaging technology
- **Activities:**
  - Harvest/Slaughter/Collection and Cleaning
  - Grading and sorting
  - Processing
  - Further processing
  - Packaging and Storing/Warehousing

#### Marketing & Consumption
- **Retail:**
  - Markets for produce
  - Local/Domestic trading
  - Export: Market in line with export standards
  - Cooperatives and sales infrastructure
  - Distribution and availability
  - Promotion support
- **Consumption:**
  - Commercial
  - Individual

### Transportation/Distribution/Logistics

### Sub-sectors

- **Crop Production**
- **Livestock**
- **Fisheries**
- **Forestry**
Nigerian Agriculture Sector -
Key Trends

Growing Population
- Nigeria has a large population of about 191 million people with an average annual population growth of 2.4%. This provides a huge market for consumer goods such as agricultural products.
- Given that the food component of agricultural produce is a basic necessity of life, as the population continues to grow, there will be a rising demand for agricultural produce.

Improving Macroeconomic Outlook
- Per capita income levels have been identified to be closely related to individual consumption of agriculture produce.
- Current rising income levels, increasing rate of urbanisation and widening middle class in Nigeria is expected to drive an increase in effective demand of several agricultural products which had previously been out of reach to most consumers.

Policies and Regulation
- Government’s drive for economic diversification has given rise to policies such as: import substitution policies, the promotion of exportation of agricultural produce from Nigeria, state and federal agricultural initiatives such as lending schemes, grants, etc.
- These measures have created an enabling environment, increasing participation in the sector.

Availability of Arable Land
- Nigeria is estimated to have up to 84 million hectares of arable land, with only 40% of this under cultivation.
- Availability and access to arable land in the country continues to drive agricultural production and overall supply.
- Internal conflict within the North-Eastern and central regions has displaced farmers within the region, reducing production.

Technology and Infrastructure
- Adoption of improved agronomic practices as well as genetics for animal breeds have combined to shorten production cycles and reasonably increase agricultural yields of agribusinesses.
- Improving levels of production, storage and supply infrastructure, storage and modern processing systems, have combined to help minimise/eliminate losses and improve overall supply.

Significant Private Sector Investment
- Increased investment from the private sector has driven the growth of the sector.
- USAID, Bill & Melinda Gates foundation, invest in smallscale farmers with tools, seeds, farming practices to improve yield of crops and productivity of livestock
- Dangote Group and other investors have recently invested in rice mills in Nigeria, with the aim of increasing local production.
Global Rice Industry

Overview

- Rice is the primary staple food for more than half of the world’s population – over 3.5 billion individuals depend on rice for more than 20% of their daily calories – with Asia, South America and Sub-Saharan Africa the largest consuming regions.

- Rice is the second largest staple crop, behind corn (maize). It is produced over vast areas of the world, with the area of land totalling 161 million hectares harvested for rice in 2017.

- Four major types of rice are produced worldwide:
  - Indica (75% global production), the most common type, is majorly grown in the tropics and subtropics including India, Central and Southern China, and the Philippines.
  - Japonica (8% global production) is from Northern and Eastern China, and grown extensively in cooler zones of the subtropics and temperate zones.
  - Aromatic (Jasmine and Basmati) (15% global production) is mainly found in Northwestern India and Pakistan.
  - Glutinous rice (<2% global production) is grown mainly in Southeast and East Asia.

- About 729 million tonnes of rice paddy was produced in 2017 (488 million tonnes of milled rice), with 652 million (~90%) produced in Asian countries. Sub-Saharan Africa produced about 25 million tonnes (~3.5%); Northern Africa, about 6.2 million tonnes (~0.8%); and Latin and Central America, along with the Caribbean, about 27 million tonnes (~3.7%).

- Rice production recorded significant growth since the start of the ‘Green Revolution’ (between the 1930s and the late 1960s) due to advances in research and development, leading to the improvement of modern agricultural inputs and processes – irrigation, fertilisers, improved, high-yield, disease-resistant seeds, pesticides, and mechanisation.

- About 700 million tonnes of rice paddy was produced in 2018 (485 million tonnes of milled rice), with 90% (640 million) produced in Asian countries. Sub-Saharan Africa produced about 3.5% (19 million tonnes); Northern Africa, about 0.8% (6.2 million tonnes); and Latin and Central America, along with the Caribbean, about 3.7% (27 million tonnes).

- Through the years (and also in 2018), China and India alone have accounted for about 50% of the global rice production and consumption. However, strong economic growth has halted the upward trend in per capita rice consumption, due to diversification of consumers diets.

- Rice provides up to 50% of the dietary caloric supply for hundreds of millions in Asia and is, therefore, critical for food security. In Sub-Saharan Africa, rice is the fastest growing staple food, with annual per capita consumption of 27kg/year.
Global Rice Industry

Production & Consumption

- Rice is grown in Irrigated, Rainfed lowland and upland as well as flood-prone environments.
- The irrigated rice ecosystem represents 54% of the world’s harvested area of rice and provides 75% of the world’s rice production. Irrigated rice is grown in bunded fields or paddies, which are surrounded by a small embankment that keeps the water in.
- The rainfed lowland environment accounts for 30% of the world’s harvested area of rice and produces 20% of the world’s rice production.
- In the rainfed upland environment, rice is grown under aerobic conditions (soil is exposed to air) and represents 9% of the world’s harvested area, contributing to only about 4% of the world’s total rice production.
- Flood-prone environments include deepwater areas and mangrove swamps submerged under water and accounts for 7% (11 million hectares) of harvested area, and contributes 1% (16.5 million tonnes) to total global rice population.

Globally, rice production exceeds its consumption, with an average surplus of 7.8 million tonnes between 2012 and 2018.
- Rice production and consumption have grown at a CAGR of 0.6% and 1.1% respectively between 2012 and 2018.
- The rice industry experienced declined production and consumption in 2015 as a result of a strong El Niño (warming of the eastern equatorial Pacific Ocean) weather effect. This resulted in delayed rains in producing countries and subsequently, reduced yield.

Production and consumption have however grown, from 2015 values, at a CAGR of 1.3% and 1.6% respectively, to close 2018 with values of 485 and 482 million metric tonnes respectively.
- “BIN” countries (Bangladesh, Indonesia and Nigeria) experience a local supply deficit and thus, rely on rice imports to meet demand. These countries have similarities characterised by multi-culture, multi-ethnic and high population.
Global Rice Industry

Consumption Per Capita among the highest-consuming countries

Top producers and consumers of rice, 2018 (million metric tonnes)

- China, India, Indonesia, Bangladesh and Vietnam account for 73% and 70% of global production and consumption respectively. All the five countries have consumption per capita values above the global average of 63kg.
- High production is due to the increasing land area available for cultivation, and adoption of innovative farming practices that improve yield; high consumption is due to large population especially in China and India.
- Consumption per capita in Nigeria is low, when compared with top producers with similar population:
  - Bangladesh, a country of 166 million people has a per capita consumption about six times Nigeria’s; and Vietnam, with a population of 97 million people has per capita consumption about seven times Nigeria’s
  - With Nigeria’s growing population, total rice consumption is expected to increase

Comparison of consumption per capita (kg) and Domestic price ($/kg)* for top consuming countries**, 2018

- Nigeria is the 11th largest consumer of rice globally and has the lowest annual consumption per capita of the top 11 consuming countries, with a value of 35 kg/year. It however, has one of the highest domestic price for a kilogram of rice, for both locally produced and imported variants in the market.
- High domestic prices for rice in Nigeria is mainly due to inflation, cost of importation (large excise tariffs have been imposed by the government in a bid to boost local production) and cost of production (for the locally produced variety). Countries with low cost of rice per kg are dominated by net export countries (India, Thailand, Vietnam, etc.) as production surplus and government interventions in rice farming usually encourage lower domestic prices.
- Consumers preference for well-milled rice in Nigeria as led to the price premium for imported rice over local rice. Imported rice costs up to 30% more than local rice. The main differentiating factors between the two include; appearance, cleanliness, swelling capacity, taste, ease of preparation and consistency of grain.
In most rice producing countries, it is a common practice for local rice production to meet its local demand. This leaves no room for exportation. However in certain countries, consumption levels exceed production.

Rice trading increased significantly between 2007 and 2018 at a CAGR of 3.98% and 4.03% for imports and exports respectively, driven by the General Agreement on Tariffs and Trade in 1994.

The current trade market accounts for nearly 10% of global production compared with 4% in the late 1990s.

International rice trade is dominated by a small number of exporting countries – India, Thailand, Vietnam, Pakistan and the Myanmar – accounting for 85% of total exports in 2018. (The United States, after decades of appearance in the top 5, was overtaken by Myanmar).

Due to the strength of the top exporters, global rice prices are heavily affected by changes in production/yield in one or many of the countries.

The import market does not have the homogenous nature of the export market; there are more playing countries within it. The top 5 import markets (China, Nigeria, the EU, Bangladesh and Indonesia) make up only 30% of the export total in 2018.

Prior to 2017, Bangladesh and Indonesia were not part of the top rice import list. However, this is no longer the case as a result of drought and flood in Bangladesh, and the government’s drive to increase rice stocks in Indonesia.

The significant decline in the price of Thailand 100% B white rice and US 2.4% long grain rice in 2013 is largely attributable to the sale of government-owned rice stocks to finance its Rice Paddy Pledging Program in Thailand, and a decrease in exports from the United States respectively.

Asian rice is traded at 340 – 430 $/tonne due to exportable availabilities that exist to meet demand from buyers while the growth in US long-grain rice is largely due to expectations of low yield and high demand for international sales.
Global Rice Industry

Outlook

Global production of milled rice is projected to increase to an all-time high of 492 million metric tonnes at the end of the 2019 season, on the back of increased harvested areas in some of the top producing countries. In the long term, production is expected to grow sluggishly, at a CAGR of 0.9% between 2018 and 2023.

Global consumption per capita is projected to remain stable with sluggish growth until 2023 (slight dips experienced in 2018 and expected in 2020). Growth is driven by increase in consumption in developing countries.

Increased health and diet consciousness in Asia resulting from the changing consumption patterns of individuals remains a key driver of consumption per capita.

Global rice trade is expected to experience long-term growth with majority of the demand coming from China, the Middle East and Sub-Saharan African countries such as Nigeria, Côte d’Ivoire, Guinea, Mozambique and Kenya.

Exports are projected to rise by 5 million metric tonnes from 49 million metric tons in 2018 to 54 million metric tonnes in 2023.

Trade growth for the forecast period is projected to be lower than the rate observed between 2012 and 2017.
- Rice prices in 2018 are in the positive (y-o-y), and are expected to maintain the momentum throughout the year, due to a smaller surplus in 2018.

- Asian market prices are expected to keep increasing in the short term, due to increasing demand from Southeast Asia.

- Increasing risk of a trade war between key suppliers (US) and importers of rice (China), as rice trade may be targeted by protectionist measures, lowering demand and sending prices lower.

- Over the longer term, the global market is expected to loosen up as global production increases.
Nigerian Rice Industry - Overview

Background

• Rice is the third-most consumed staple food in Nigeria (after maize and cassava) and has become a food security crop due to its increased significance in the country.

• There is a growing market for rice in Nigeria. This is as a result of a population of about 195 million people (estimated) and an average annual growth projection of 2.6% over the last 10 years.

• With rapid population growth expected to exceed 200 million by 2019, it is expected that the demand for rice will be sustained and increased in the foreseeable future.

• Rice is cultivated in all Nigeria's agro-ecological zones, from the mangrove swamps of the Niger Delta to the dry zones of the Sahel in the North. However, the North West accounts for 72% of total rice production.

• A total land area of 3.2 million hectares was harvested by 1.43 million farmers in the 2018/2019 season.

• Rainfed lowland is the most predominant rice production environment covering 47% of cultivated area and accounting for over 50% of the total rice produced in Nigeria, while rainfed upland rice (30% cultivated area, 17% domestic production), irrigated systems (17% cultivated area, 27% domestic production), deep water and mangrove swamp environments (6% cultivated area, 4% domestic production) are the other rice production environments in Nigeria.

• As well as being an important food security crop, it is an essential cash crop for small-scale farmers who commonly sell 80% of total production and consume only 20%. Rice generates more income for Nigerian farmers than any other cash crop in the country.

• The two types of rice mainly cultivated in Nigeria are the African Rice (Oryza glaberrima) and the Asian rice (Oryza sativa). In recent times however, new hybrid varieties have been introduced such as NERICA.

Rice Production Systems in Nigeria

North West Zone
• Rainfed uplands and irrigated land systems
• Deepwater floating areas are also found around River Rima in Kebbi
• Kano is the principal trading hub of the zone
• Staple Crop Processing Zones (“SCPZ”) for rice processing are proposed to be located in Kano, Kebbi and Sokoto

North Central Zone
• Rainfed upland and irrigated land systems
• Zaria is the principal trading hub of the zone
• SCPZ for rice processing is proposed to be located in Niger

North East Zone
• Rainfed lowlands and irrigated land systems
• Maiduguri is the principal trading hub of the zone
• SCPZ for rice processing is proposed to be located in Taraba

South East Zone
• Rainfed uplands, irrigated land systems and rainfed lowlands
• Aba and Onitsha are the principal trading hubs of the zone
• SCPZ for rice processing is proposed to be located in Enugu and Anambra

South South Zone
• Rainfed lowlands & uplands, and mangrove swamps
• There are also irrigated land systems and deep water floating areas
• Port Harcourt and Warri are the principal trading hubs of the zone

South West Zone
• Rainfed uplands & lowlands and irrigated land systems
• Lagos is the principal trading hub of the zone
Nigerian Rice Industry -

Overview

Rice Production in Nigeria by states (2017)

Estimated production volume of top rice producing states in Nigeria (’000 tonnes)

- Almost all states in Nigeria produce rice. However, the North-Western region of the country produces the highest volumes, followed by the North Central region.
- In the southern region, Ebonyi, Ogun and Ekiti States produce the most rice.

Nigeria is the largest producer of rice in West Africa (2nd in Africa, after Egypt), with production increasing at a CAGR of 6.5% over the past decade, reaching 3.8 million metric tonnes in 2018. The average yield in the country is approximately 1.8 metric tonnes per hectare.

In Nigeria, rice consumption far exceeds production with a yearly average production deficit of about 2.4 million tonnes recorded between 2007 and 2018. In order to meet the present deficit due to insufficient local production, Nigeria imports rice from several exporting countries to increase its total supply. In 2018, 3 million tonnes of rice was imported into Nigeria, via its shipping ports as well as informal cross-border channels (importation through land borders is prohibited). Nigeria imports most of its rice from Thailand, India and the USA, incurring a bill of about $5 million daily.

Total demand between 2007 and 2018 increased at a rate of 5.3%, while imports increased at a rate of 5.24% in the same period. These indicate that demand for rice is increasingly being met by local production – chief importers of milled rice, e.g., Stallion, now mill locally produced rice in the country.
Nigerian Rice Industry -
Industry Value Chain

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<th>Players</th>
<th>Cultivation</th>
<th>Paddy trading/ aggregation</th>
<th>Processing</th>
<th>Distribution</th>
<th>Consumption</th>
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<td>Small-scale farmers</td>
<td>Input developers and suppliers</td>
<td>Local buying agents/rural traders</td>
<td>Small-scale millers</td>
<td>Large-scale distributors</td>
<td>Household</td>
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<td>Large-scale farmers</td>
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<td>Medium-scale millers</td>
<td>Commission agents</td>
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<td>Industrial-scale millers</td>
<td>Speculative middlemen</td>
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<td>Wholesalers</td>
<td>Institutional</td>
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<td>Retailers</td>
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<thead>
<tr>
<th>Activities &amp; products</th>
<th>Input development and sourcing</th>
<th>Paddy trading</th>
<th>Processing</th>
<th>Distribution</th>
<th>Consumption</th>
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<tr>
<td>Pre-planting: soil testing, land preparation, etc.</td>
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<td>Planting</td>
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<td>Post-planting activities: weed/pest control, etc.</td>
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<td>Harvesting</td>
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<tr>
<td>Straw</td>
<td>Paddy</td>
<td>Bran</td>
<td>White rice</td>
<td>Nutrient coating</td>
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<td></td>
<td></td>
<td>Husk</td>
<td>Brown rice</td>
<td>Destoning</td>
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<tr>
<td>Parboiling</td>
<td>Further processing</td>
<td>Packaging</td>
<td>Retail</td>
<td>Cooking</td>
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<td></td>
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<td>Wholesale</td>
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<td></td>
<td></td>
<td></td>
<td>White rice</td>
<td>Fried rice</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Jollof rice</td>
<td>Coconut rice</td>
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<td>Tuwo</td>
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Industry association:
Rice Farmers Association of Nigeria (RIFAN)
National Rice Millers Association of Nigeria (NRMAN)
Over 70% of rice production in Nigeria is from rainfed lowlands and irrigated land systems.

<table>
<thead>
<tr>
<th>Key Players</th>
<th>Location</th>
<th>Land area (ha)</th>
<th>Investment</th>
<th>Cultivation model</th>
</tr>
</thead>
</table>
| Dangote Group                   | Edo, Jigawa, Kebbi, Kwara and Niger | 150,000        | $1bn       | • Self-cultivation  
• Pure out-grower  
• Contract tenants |
| Kereksuk Rice Farms             | Nassarawa              | 45,000         | Not Available | • Not Available |
| WEMS Agro                       | Ondo                   | 25,000         | $13.4mn    | • Not Available |
| Olam Group                      | Nassarawa              | 16,000         | $>52mn     | • Self-cultivation  
• Pure out-grower  
• Contract tenants |
| JOSAN Integrated Rice Farms and Mills | Anambra              | 15,000         | Not Available | • Out-grower scheme with partnerships/alliances |
| Coscharis Farms                 | Anambra                | 10,000         | Not Available | • Out-grower scheme |
| Pearl Universal Impex Ltd       | Niger                  | 7,500          | $100mn     | • Pure out-grower scheme  
• Self-cultivation |
| Haske and Williams              | Adamawa                | 5,000          | Not Available | • Not Available |
| Labana Rice Farm                | Kebbi                  | 1,400          | Not Available | • Not Available |
• There is increasing participation from the public sector (state governments), in partnership with the private sector:

• Lagos and Kebbi signed an MoU to invest in rice production. In December 2016, they commenced distribution at the rate of N13,000 per 50 kg bag

• Anambra has partnered with Coscharis Group to increase rice production from present 80,000 MT to 400,000 MT

• In 2016, Ebonyi state provided N1bn loan to commercial rice farmers in the form of seedlings, fertilisers, pesticides, etc. It also set aside 54,000ha for massive rice cultivation in 2016

• Edo state is partnering with Stallion Group for investment into rice production
The major seed varieties grown in Nigeria are the FARO varieties. Several seed development companies/organisations develop higher-quality, improved seeds

### Major seed varieties grown in Nigeria

<table>
<thead>
<tr>
<th>Name</th>
<th>Days to Maturity</th>
<th>Yield range (tonnes/ha)</th>
<th>Grain Shape</th>
<th>Amylose content*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faro 44</td>
<td>115</td>
<td>4.0 – 6.0</td>
<td>Long</td>
<td>26</td>
</tr>
<tr>
<td>Faro 45</td>
<td>100</td>
<td>2.0 – 3.0</td>
<td>Medium</td>
<td>174</td>
</tr>
<tr>
<td>Faro 46</td>
<td>105</td>
<td>2.0 – 3.5</td>
<td>Medium</td>
<td>22.5</td>
</tr>
<tr>
<td>Faro 47</td>
<td>115</td>
<td>2.0 – 4.0</td>
<td>Long</td>
<td>10.5</td>
</tr>
<tr>
<td>Faro 48</td>
<td>128</td>
<td>2.5 – 4.0</td>
<td>Medium</td>
<td>16.4</td>
</tr>
<tr>
<td>Faro 49</td>
<td>120</td>
<td>2.0 – 4.5</td>
<td>Medium</td>
<td>16.2</td>
</tr>
<tr>
<td>Faro 50</td>
<td>125</td>
<td>4.0 – 6.0</td>
<td>Medium</td>
<td>28</td>
</tr>
<tr>
<td>Faro 60 (L19)</td>
<td>125</td>
<td>4.0 – 6.0</td>
<td>Long</td>
<td>-</td>
</tr>
<tr>
<td>Faro 61 (L34)</td>
<td>125</td>
<td>4.0 – 6.0</td>
<td>Long</td>
<td>-</td>
</tr>
</tbody>
</table>

*The amylose content influences the cooking and eating of the rice. Rice with a high amylose content (25-30%) tends to cook firm and dry, whilst rice with lower amylose content tend to be soft and sticky.

### Seed Production Companies

- Private organisations licensed by Federal Ministry of Agriculture and Rural Development (FMARD) to produce, for commercial purposes, seeds for Nigeria. They include:
  - Premier Seeds Nigeria, Kaduna
  - Nagari Seed Nigeria, Kaduna
  - The Seed Project Company, Kano
  - Maslaha Seeds Nigeria, Zamfara
  - Alheri Seeds Nigeria Limited, Kaduna

### National Seed Service

- Unit of the National Agricultural Seed Council responsible for:
  - Development, certification, distribution and quality control of seeds
  - Seed technology development, technical support services, seed industry development and co-ordination of breeder and foundation seed
  - Publication of a list of registered, released or notified seed varieties approved for commercialisation in Nigeria

### National Cereals Research Institute (NCRI)

- Charged with national mandate for the genetic improvement of Rice, Sugarcane, Soybean, Acha, Beniseed, and Castor throughout the country
- Produces breeder and foundation seeds
- Carries out research on farming systems within the North Central zone.
- So far, has released 57 improved rice varieties which most farmers are using in Nigeria

### Institute for Agricultural Research (IAR)

- IAR has recommended seed varieties and practices for modern agricultural farming in Nigeria
Nigerian Rice Industry - Cultivation

Government Interventions and Incentives applicable to operators in the cultivation segment

**Tax Incentives**

Nigerian companies involved in the rice industry are entitled to the following incentives:

- Corporate income tax holiday of 3 (Three) to 5 (Five) years for any company involved in:
  - Rice milling: husked, milled, polished, glazed and/or parboiled rice.
  - Rice flour
  - Accelerated claim of capital allowance on agricultural plant expenditure. Additional capital allowances are also available where the plant and equipment used in the production of rice is gas fired.
  - Non-restriction of capital allowances claimable in a year of assessment
  - Non-payment of minimum tax
  - Reserves for research and development expenses are tax-deductible provided that they are less than 10% of the total profits of the company in the year under review.
  - Value Added Tax (VAT) exemption on sale of basic food items. Rice is considered as basic food item in Nigeria
  - VAT exemption for farming machinery and farming transportation equipment
  - VAT exemption for tractors, ploughs, agricultural equipment and implements purchased for agricultural purposes.
  - Certain agricultural and agro-industrial machines and equipment enjoy zero percent (0%) import duty
  - Various export related incentives, where the rice produced is ultimately exported.

**Nigerian Incentive Based Risk Sharing System for Agricultural Lending**

- NIRSAL enables affordable financing to all players along entire agricultural value chains.
- It reduces the risks of financing institutions while granting agricultural loans by building the capacities of both banks and value chain actors on good practices in agricultural financing, loans utilisation and repayment.

**Agricultural Implements and Mechanisation Services**

- The minister of Agriculture and Development has recently announced that the federal government is to introduce a new programme called Agriculture Implement and Mechanisation scheme
- The programme will focus on improving agricultural mechanisation and the provision of farm implements based on Public Private Partnership (PPP) that will assist both big and smallholder farmers to easily access equipment leasehold and ownership

**Presidential Fertiliser Initiative Programme (PFI)**

- The PFI aims to revive Nigeria’s under-utilised fertiliser blending industry.
- The Nigeria Sovereign Investment Authority (NSIA) has made several agreements to purchase inputs required for NPK fertiliser at discounted prices, which are then provided to blending companies and sold to agro dealers and state governments at discounted rates, making the locally blended output cheaper than the imported finished versions. The revenue from the sale is then remitted to the NSIA for reinvestment. 11 blending plants have signed on as contract blenders, they each receive a fee for blending.
Nigerian Rice Industry - Processing

Players in the processing value chain segment of the rice industry can be grouped into two broad categories:

- **Small & medium scale millers**
  - Annual milled rice output of small-scale millers: <3,000MT
  - Annual milled rice output of medium-scale millers: <10,000MT
  - Account for about 80% of processed rice in Nigeria

- **Large scale millers**
  - Annual milled rice output of large-scale millers: >10,000MT
  - Account for about 20% of processed rice in Nigeria
  - Estimated number of large-scale millers in the country: 23

### Players, Location, Milling Model, Current Capacity (MT/Annum), Target Capacity (MT/Annum), Rice Brand

<table>
<thead>
<tr>
<th>Players</th>
<th>Location</th>
<th>Milling Model</th>
<th>Current Capacity (MT/Annum)</th>
<th>Target Capacity (MT/Annum)</th>
<th>Rice Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stallion Group</td>
<td>Lagos, Kano</td>
<td>Milling only for ~9,000 farmers across 14 states</td>
<td>430,000</td>
<td>1,500,000</td>
<td>Royal Stallion, Caprice, etc.</td>
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<tr>
<td>Dangote</td>
<td>Jigawa</td>
<td>Integrated</td>
<td>240,000</td>
<td>960,000</td>
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<tr>
<td>Stine Rice</td>
<td>Anambra</td>
<td>Milling Only</td>
<td>141,000</td>
<td>Not Available</td>
<td>Anambra Rice, Stine Rice, Oyoyo Rice</td>
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<td>Labana</td>
<td>Kebbi</td>
<td>Integrated</td>
<td>96,000</td>
<td>Not Available</td>
<td>Labana Rice</td>
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<tr>
<td>Mikap Nigeria</td>
<td>Benue</td>
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<td>44,880</td>
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<td>Olam</td>
<td>Nasarawa</td>
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<td>36,000</td>
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<td>Mama’s Pride</td>
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<td>Ebony Agro</td>
<td>Ebonyi</td>
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<td>Wicklow Group</td>
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<td>Coscharis Group</td>
<td>Adamawa</td>
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<td>20,000</td>
<td>Cosrice</td>
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</table>
Nigerian Rice Industry - Processing

Government Interventions and Incentives applicable to operators in the processing segment

1. **Staple Food Crop Processing Zones**
   - This idea focuses on attracting private sector agribusinesses to set up processing plants in zones of high food production, to process commodities into food products.
   - This would be enabled by the government putting in place appropriate fiscal, investment and infrastructure policies for Staple Crops Processing Zones.
   - The BOI’s 5bn Naira Cottage Agro Processing (CAP) Fund finances the establishment of agro processing plants for industries within and outside the Staple Food Crop Processing Zones across Nigeria to minimise pre-processing loss.

2. **CACS - Commercial Agriculture Credit Scheme**
   - CBN approved the Paddy Aggregate Scheme (PAS) as a special window under the CACS in the third quarter of 2017.
   - The Scheme is a working capital facility for integrated rice millers at 9 per cent interest rate and 6 months tenor.
   - To further facilitate access by prospective beneficiaries, the single obligor limit under the CACS was also waived for beneficiaries under the Scheme.

3. **ABP - Anchor Borrowers Programme**
   - The ABP is intended to create a linkage between anchor companies involved in processing and small holder farmers (SHFs) of the required key agricultural commodities.
   - To achieve this, the ABP provides farm inputs in kind and cash (for farm labour) to small holder farmers to boost production of these commodities, stabilise inputs supply to agro processors and address the country’s negative balance of payments on food.
   - At harvest, the SHF supplies his/her produce to the Agro-processor (Anchor) who pays the cash equivalent to the farmer’s loan account.

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Sales of rice has increased significantly over the past 10 years, with a CAGR of 19%. This has been largely driven by increased prices and consumption of rice in the market.

Due to the economic recession, the average price of rice increased by 61.3% from an average of N178 per kg in 2015 to N290 per kg in 2016. The market was worth an estimated N2.5 trillion in 2018.

Price is another key influencer of market size, as the 2016 recession-induced increase in the price of rice caused the market to grow y-o-y by 66.4%, from N1.1 to N1.9 trillion.

Approximately 90% of rice sales, occurs in the informal market, being sold in loose form, via traditional retailers.
Nigerian Rice Industry -
Value Chain Analysis

Channel distribution for rice, % breakdown

- Loose sales are usually by measure and not by weight (although there is a loose link). Measures are Moodu or Tia (both ~800g), Kongu (~1.5 kg), Rubber (~2.5 kg).
- Modern grocery retailers such as supermarkets, hypermarkets and convenience stores account for less than 0.5% of all rice sold in Nigeria; Nigerians still depend heavily on independent small traders to purchase rice.
- Most local rice brands are counted within 'others' which take up 30% of total sales through formal channels.

Competitive landscape:
Top brands in formal retail market; value (N‘billion) 2018**

- Formal retail outlets account for c.10% of total rice sales (N245 billion)
- The top three brands bought through formal retail outlets include Caprice, Royal Stallion and Mama Gold (not imported into Nigeria since 2015), accounting for over 50% of the market. They are all Thai brands of rice.
- Lintex, is the only local brand with a sizeable market share (2%) of formal sales channels and is the fastest growing of the top brands between 2012 and 2018. It grew at a CAGR of 73% between 2013 and 2018.
- Consumers’ preference for well milled, high quality rice, drives the sales of imported brands over local brands.

**Formal retail market applies to all rice sales from grocery stores. Bulk/loose/unpackaged rice is excluded from this analysis.
Trends and drivers for rice demand in Nigeria

- In countries where rice is a key component of the average diet (regardless of income, age, class, health status etc.), population growth generally leads to increased rice consumption.
- The population of Nigeria is currently estimated at 198 million, with an annual population growth rate of 2.4% and is expected to maintain a positive growth rate into the future.
- This creates a natural demand for rice products in the country across all demographics.

- There has been a downward trend in the rural:urban ratio over the past 25 years. As more regions within the country become increasingly urban, consumption and demand for rice, will increase.
- Urban individuals prefer the ease that preparation of rice provides, when compared with other staple foods; this has seen consumption of traditional cereals dropping significantly, while the share of rice consumed has grown over the last 4 decades.

- With rising income levels and rapid urbanisation across the country, consumers are increasingly becoming more sophisticated.
- Their lifestyle changes have made consumers shift from traditional staples (cassava, yams) to rice, with a preference for imported rice to locally produced rice on quality grounds.
- Consumers are becoming more health conscious, preferring local and foreign rice varieties such as ofada and basmati, due to their high nutrient content.

- In Nigeria, free rice donations to rural inhabitants/ refugees as part of a CSR/ developmental scheme, or, the giving of rice as gifts to individuals during the festive/holiday periods is increasingly becoming a trend.
- Large volumes of rice are usually needed during these periods for give-away to individuals/ groups and/ or internally displaced citizens either as gifts or as a form of humanitarian outreach.
Nigerian Rice Industry -
Supply Drivers

The key trends and drivers for the supply of rice in Nigeria

- Historically, the price of rice in the global market inversely affects its supply. Due to the prevalence of natural disasters in rice exporting countries, there has been a significant shortage in rice production which has increased the export price of the commodity and has adversely affected importation by countries such as Nigeria.

- There has been an increase in private sector participants into various segments of the rice value chain in recent years, with some participants operating in multiple segments of the value chain, to ensure high quality output.

- Dangote Group has invested over $1 billion in the construction of a processing mill in Hadin, Jigawa state. The integrated mill will process paddy from the out-growers programme which the group also started in the state.

- Olam Nigeria Limited announced a total investment of $111 million to introduce mechanised rice farming in Nassarawa state. The company also runs an outgrowers programme, supporting farmers with training, pre-finance support, fertiliser and seeds in order to boost their productivity.

- Nigeria’s average rice yield per hectare is merely 1.8 tonnes, below the sub-Saharan average of 2.2 tonnes and significantly below average yield obtainable in other rice producing countries, including China and Egypt, with 6.9 and 8.2 tonnes respectively (see case study of rice production in Egypt vs Nigeria on page 28). This difference can be largely attributed to the deployment of advanced agricultural technologies in these countries. Technology deficiency across the value chain significantly affects the production output of rice in the country.

- The general state of infrastructure has an adverse effect on the local rice production, as an estimated 12.4% of rice produced is wasted due to post-harvest losses from inadequate storage and transportation, inefficient milling, etc.

- Several policies, regulations and intervention schemes have been introduced by the Nigerian government in a bid to boost local rice production. These policies include the recent farm subsidies, farmers insurance policies, and rice import restrictions, etc. which continue to boost producer confidence to scale up production in the local supply of rice.

- Increasing interventions through grants and social development programmes from organisations such as FAO, World Bank, etc., to small scale rice producers are aimed at sensitising farmers with farming best practices and connecting players within the rice value chain in the hopes of increasing quality and quantity of rice in Nigeria.
Case Study of Rice Production in Egypt vs Nigeria

Egypt is one of the biggest rice producers in Africa. Average rice yield per hectare is 1.8 tonnes in Nigeria compared to 8.2 tonnes in Egypt. The difference is attributable to deployment of advanced agricultural technologies, use of better seedings and better farming practices in Egypt.

Egyptian rice is produced in two main seasons: the short season in January-March and the long season in April-July. The short season is usually more profitable due to the better climate, but it is also more affected by pests and diseases.

In Egypt, the main biophysical factors affecting rice production are:
- **Sunlight**: Very favorable and ubiquitous sunshine
- **Soil fertility**: High grade and productivity Calcaric Fluvisols that occupy the Delta and floodplain of Nile River
- **Water and Irrigation**: Advanced and controlled irrigation system
- **Diseases and Pest pressure & control**: Development of pest and disease resistant varieties

In Nigeria, the main biophysical factors affecting rice production are:
- **Sunlight**: Adequate sunlight and favorable weather
- **Soil fertility**: Medium-low grade vertisols, Ferasols make up almost 50% Of the Nigerian soil
- **Water and Irrigation**: Ad-hoc irrigation done on a needs basis
- **Diseases and Pest pressure & control**: Pest and disease are kept below economic threshold levels

In terms of socio-economic factors:
- **Crop management**: Application of routine crop management techniques e.g Regular application of fertilizer
- **Access to Technology**: Underdeveloped distribution system limits access to Farm inputs and technology

In Egypt, the main socio-economic factors affecting rice production are:
- **Crop management**: Adoption of precision crop management practices
- **Access to Technology**: Transfer of appropriate Technology to farming communities

In Nigeria, the main socio-economic factors affecting rice production are:
- **Crop management**: Low access and use of modern technology
- **Access to Technology**: Underdeveloped distribution system limits access to Farm inputs and technology

Environmental differences & non-transferable factors

Key:
- **Nigeria**:
- **Egypt**:

Source:
- Rice Diseases in Nigeria: http://www.tandfonline.com/doi/abs/10.1080/09670877409418218
These include the industrial scale integrated farms and mechanised processing plants, which account for only 20% of rice production in Nigeria.

- The Nigerian government frequently changes existing policies relating to agriculture such as import tariffs. We have had several policy backflips and this has resulted to strategy definition challenges for investors generally.
- Such an inconsistent policy environment may also discourage private sector investors due to uncertainty regarding returns on investments.
- Underdeveloped infrastructure is a nationwide issue which has remained prevalent in Nigeria over the years. Provision of water, power and other infrastructure requirements such as good road networks is generally suboptimal.
- Large scale farms typically incur significant costs in the provision of required infrastructure such as power and water, which lead to price increases, impacts consumption and reduces profitability.
- Rice production is relatively capital intensive, and has a medium to long term payback period. It is therefore critical to access cheap sources of funding for rice farming. However, most government incentives and interventions for the agricultural sector are aimed at benefiting poor small holder farmers, hence it may be difficult for large farms to obtain direct financial assistance from these incentives.
- The absence of or poor quality of collateral and uncertainty about rice yield creates a lack of confidence in the sector by the financial services providers who are thus unwilling to provide loans to the sector without government guarantees or subsidies.
- Banks who are willing to bear the ‘risk’ of lending to players, do so at overbearing interest rates.
- The parboiling and milling process usually require the use of rice species of the same or similar quality or shape, with minimal impurities. However, due to the high level of inconsistency in the rice species grown by various outgrowers as well as the large amounts of impurities in the outputs, the parboiling and sorting process is usually suboptimal.
- In addition, the seasonal availability of locally grown paddy could lead to long periods of underutilisation.
The Nigerian rice industry regulators and other stakeholders is detailed below

**Regulators**

- **Federal Ministry of Agriculture and Rural Development** formulates agriculture-related policies; regulates activities related to agriculture and oversees agricultural research in the country.

- **The National Agency for Food and Drugs Administration and Control** publishes guidelines prescribing the minimum good manufacturing practice requirements and quality controls for manufacturing, processing and packaging of food products.

- **The Standards Organisation of Nigeria** ensures that locally manufactured products in Nigeria comply with government policies on standardisation and conformity assessment.

**Industry Associations**

- **The Rice Farmers Association of Nigeria (RIFAN)** is the advocate for all segments of the Nigerian rice industry with a mission to promote and protect the interests of its members. RIFAN has over 12.2 million members who are involved in all range of activities across the value chain.

- **Similar to RIFAN, the National Rice Millers Association of Nigeria (NRMAN)** promotes and protects the interests of its members; all of whom are involved in the milling of rice.

**Relevant research Institutes**

- **Institute for Agricultural Research (IAR)**

- **National Cereals Research Institute (NCRI)**

- **National Seed Service**

- **International Institute of Tropical Agriculture (IITA)**

**Source**: Organisation websites
The key legislation/policies and fiscal provisions applicable to the sector are summarised below.

**Land Use Act (1978)**
Subject to the provisions of the Act, all land comprised in the territory of each State in the Federation are vested in the Governor of that State and held in trust and administered for the use and common benefit of all Nigerians in accordance with the provisions of the Act. Thus, the act makes it lawful for the Governor in respect of land, to grant statutory rights of occupancy to any person for all purposes.

**Water Resources Act (1993)**
The Act allows any person to take water without charge for his domestic purpose or for watering his livestock from any watercourse to which the public has free access and to use water for the purpose of fishing or for navigation to a reasonable extent. The Act also allows any land owner to take and use water from the underground water source or if abutting on the bank of any watercourse, from that watercourse.

**Agriculture Promotion Policy (2016)**
APP seeks to partner closely with private investors across farmer groups and companies, to develop end-to-end value chain solutions. Operators will receive facilitated government support, as they make deep commitments to engaging a new generation of farmers; improving supply of specialised agro chemicals, as well as wider scale use of high yielding seeds. In addition, The government will work with investors, to sharply improve the distribution system, reduce post-harvest losses and overall, improve nutritional outcomes.

**Environmental Impact Assessment Act (1992)**
The EIA Act prevents the public or private sector of the economy from undertaking or embarking on public or authorised projects or activities without prior consideration, at an early stage of their environmental effects. Where the extent, nature or location of a proposed project or activity is such that is likely to significantly affect the environment, the Act mandates that its environmental impact assessment be undertaken in accordance with the provisions of the Act.

**National Seed Policy (2014)**
The policy charges the Federal Government, under the coordination of the NASC, with responsibility of maintaining public-service infrastructural and service support required to maintain efficient seed supply, enhancing farmer demand for improved seeds, and creating an enabling environment favourable for investment in seed business. The policy also stipulates the withdrawal of the public sector from commercial production of seeds.
Most state governments have huge interest in promoting agriculture and granting institutional farmers access to land at cheaper or no cost. Various State Governments in the country have embarked on various initiatives and public-private partnerships to increase rice cultivation in the country.

**Federal Government of Nigeria**

Initiatives such as the Growth Enhancement Support Scheme (GESS) aimed at stimulating a thriving private sector fertiliser and seed industry and enhancing agricultural productivity.

**Lagos and Kebbi State**

Lagos and Kebbi State have entered a partnership to produce and market rice on a large-scale basis to boost food security. The product, Lake rice is sold at a subsidised rate.

**Ondo State, in partnership with Africa Red Crest**

Ondo state government has signed a memorandum with Agro-allied firm Africa Red Crest for the mass production of rice.

**Ebonyi State**

To make the goal of economic diversification achievable, the Ebonyi State government launched a one-man, one-hectare scheme, with the target of capturing 80,000 farmers and providing them with soft loans.

**Anambra State**

Anambra State aims to significantly boost rice production, and become one of the top 3 producers of rice in Nigeria through its Anambra Rice initiative.

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Demand for rice in Nigeria is expected to grow in line with strong demand drivers. However, to achieve self-sustenance, the industry still requires significant investment.

- Production is expected to grow annually between 2018 and 2023 at an average of 3.2%, driven by private sector investment and pro-production trade policies.
- There is likely to be greater demand for locally produced rice as imports become more expensive given the uncertainty of the foreign exchange market and probable ban of imported rice.
- Consumption is estimated to moderately grow at a CAGR of 2.16% between 2018 - 2023 driven primarily by population growth.
- Local players remain wary of the threats posed by rice imports and smuggling, however the government is making efforts at controlling smuggling.
- Although it is more expensive, imported rice is preferred by most Nigerians on the basis of general perceptions of it being of high quality and better tasting. We expect more initiatives by the Government to drive demand for locally produced rice. We also expect investments in rice mills that bring locally produced rice to the standard of imported rice.
- Restrictions on forex allocation to rice traders and naira depreciation in the forex market will likely lead to reduction in imports and subsequently, an increase in the price of imported rice. This is expected to cause a shift in consumer demand and create a greater market for local rice.

- Total sales is expected to increase significantly, over 2.5 times of its 2018 value by 2023. This increase will be driven by increase in population and urbanization, and the attendant increase in consumption rates.

*Assuming all consumed rice is bought at retail value and uniform growth in size of market from 2007.
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<th>Abbreviation</th>
<th>Description</th>
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<td>ABP</td>
<td>Anchor Borrowers Programme</td>
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<td>APP</td>
<td>Agriculture Promotion Policy</td>
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<td>BBC</td>
<td>British Broadcasting Corporation</td>
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<td>BIN</td>
<td>Bangladesh, Indonesia and Nigeria</td>
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<tr>
<td>BOI</td>
<td>Bank Of Industry</td>
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<td>BMI</td>
<td>Business Monitor International</td>
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<td>CACS</td>
<td>Commercial Agriculture Credit Scheme</td>
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<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
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<td>CAP</td>
<td>Cottage Agro Processing</td>
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<td>CBN</td>
<td>Central Bank of Nigeria</td>
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<td>CSR</td>
<td>Corporate Social Responsibility</td>
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<td>ECOWAS</td>
<td>Economic Community Of West African States</td>
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<td>EIA</td>
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<td>Economist Intelligence Unit</td>
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<td>European Union</td>
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<td>Food and Agriculture Organisation</td>
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<td>FEWS NET</td>
<td>Famine Early Warning Systems Network</td>
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<td>FMARD</td>
<td>Federal Ministry of Agriculture and Rural Development</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GESS</td>
<td>Growth Enhancement Support Scheme</td>
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<td>IAR</td>
<td>Institute for Agricultural Research</td>
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<td>IFAD</td>
<td>International Fund for Agricultural Development</td>
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<td>IRRI</td>
<td>International Rice Research Institute</td>
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<td>MSME</td>
<td>Micro, Small and Medium Enterprises</td>
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<td>NASC</td>
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<td>National Bureau of Statistics</td>
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<td>National Cereals Research Institute</td>
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<td>BMI</td>
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<td>Over 3.5 billion individuals depend on rice for more than 20% of their daily calories</td>
<td>Ricepedia – The global staple</td>
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<td>Rice is the second largest staple crop after corn</td>
<td>USDA, 2019</td>
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<td>About 700 million tonnes of rice paddy was produced in 2018</td>
<td>Ricepedia – Rice Productivity, 2019</td>
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<td>Rainfed upland environment</td>
<td>Ricepedia – Where is rice grown?</td>
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<td>Warming of the eastern equatorial Pacific Ocean</td>
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<td>75% of the world’s rice production</td>
<td>GRiSP (Global Rice Science Partnership), Rice almanac, 4th edition</td>
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<td>Top producers and consumers of rice, 2018</td>
<td>USDA, NCS, BBC</td>
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<td>USDA, FAO, UN, KPMG Analysis, June 2018</td>
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<td>KPMG Research, June 2018</td>
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<td>IRRI - Trends in Global Rice Trade; FAO – Rice Market Monitor (April 2018)</td>
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<td>Bangladesh and Indonesia were not part of the top rice import list.</td>
<td>FAO – Rice Market Monitor</td>
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<td>Rice Paddy Pledging Program in Thailand</td>
<td>USDA – Grain and Feed Annual Thailand</td>
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<td>Low yield and high demand for international sales</td>
<td>FAO – Rice Market Monitor (April 2018)</td>
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<td>Growth is driven by increase in consumption in developing countries</td>
<td>USDA – Rice Outlook</td>
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<td>Increased health and diet consciousness in Asia</td>
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<td>Global rice trade is expected to experience long term growth</td>
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<td>Increasing risk of a trade war between key suppliers and importers of rice</td>
<td>BMI – Commodity Price Forecast Rice</td>
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<td>There is a growing market for rice in Nigeria</td>
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<td>North West accounts for 72% of total rice production</td>
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<td>Total land area of 3.2 million hectares</td>
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<td>Nigeria imports most of its rice from Thailand, India and the USA.</td>
<td>BBC</td>
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<td>Lagos and Kebbi signed an MoU</td>
<td>ECOWAS Rice Factbook</td>
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<td>Ebonyi state provided N1bn loan to commercial rice farmers</td>
<td>UNAAB: Rice Transformation Project Proposal</td>
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<td>Edo State partnering with Stallion Group</td>
<td>The Nation Online <a href="https://thenationonlineng.net/race-huge-rice-farms-2/">https://thenationonlineng.net/race-huge-rice-farms-2/</a></td>
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<td>Agricultural Implements and Mechanisation Services</td>
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<td>Daily Trust; The People’s Daily; The Sun; The Guardian; Dunn Loren Merrifield; The Guardian; QuarraRice; KPMG Research, June 2018</td>
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<td>BBC - Why does Nigeria import so much rice?</td>
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<td>NBS – Prices of Select Food Items in Nigeria, July 2019</td>
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<td>Euromonitor Database “Rice in Nigeria, 2018”; NBS and KPMG Analysis, August 2019; KPMG Research, August 2019; This Day, “Inside the Lagos Rice Market”, March 2018</td>
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<td>Downward trend in the rural-urban ratio over the past 25 years</td>
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<td>Share of rice consumed has grown over the last 4 decades</td>
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<td>Dangote Group has invested over a $1billion in the construction of a processing mill</td>
<td>This Day Online “Inside the Lagos Rice Market”, March 2018</td>
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<td>Technology deficiency across the value chain</td>
<td>KPMG Research (June 2018)</td>
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<td>FADAMA AF I; CBN; EPRA – Effect of Growth Enhancement Scheme on food Security status of rural farming households in Adamawa State, Nigeria; IFAD website</td>
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<td>BMI; Euromonitor Database – Rice Production and Consumption, 2018; USDA; KPMG Analysis, August 2019</td>
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