

NIGERIAN CASSAVA INVESTMENT OPPORTUNITIES

AFRICA INVESTMENT SUMMIT

London, January 2020



**NIGERIAN
INVESTMENT
PROMOTION
COMMISSION**

Dalberg

Contents

- 1 Nigeria Cassava Overview
- 2 Nigeria Cassava Investment Opportunities
- 3 Case studies
- 4 Investor Services

Nigeria Cassava Overview

- 1 Nigeria Cassava Overview
- 2 Nigeria Cassava Investment Opportunities
- 3 Case studies
- 4 Investor Services

Nigeria is the world's largest producer of cassava, but primarily supplies the domestic market at the present time

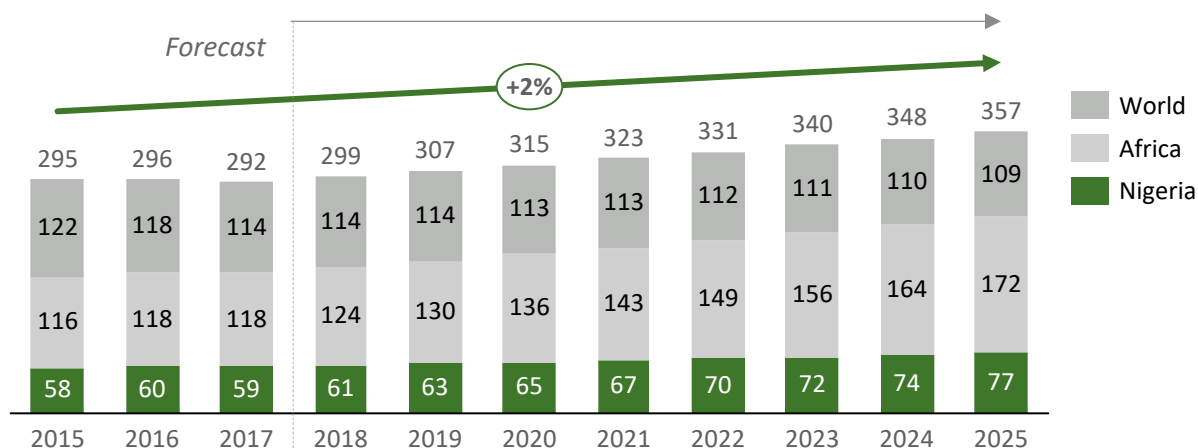


Cassava production is large and growing

- Nigeria is the largest producer of cassava globally, **accounting for 20% of global production volume and growing at an average annual rate of 3% per year from 2007 to 2017**
- However, the cassava value chain is highly fragmented with **c.90% of producers being small holder farmers and primary processors being small rural mills**

Growth in cassava production in Nigeria

Million MT per annum



Cassava consumption is widespread in Nigeria, but value-addition potential is untapped

- Cassava can deliver more calories per acre than any cereal and is considered a staple food in the Nigerian domestic market, with **98% of cassava currently converted to low-value food-grade products for domestic consumption**
- Despite the current demand for cassava being driven by low-value goods, there is **significant value in processed cassava derivatives** in both domestic and international markets

Cassava is an extremely versatile substance with a wide number of applications and lucrative derivative products



Description

Cassava Chips

Dried cassava chips are **primarily exported** and then used to **produce ethanol** for pharmaceutical, beverage and biofuel purposes. Cassava chips are also utilised in **animal feed** domestically

Ethanol

Cassava can produce up to 99.5% **pure anhydrous ethanol** which can be blended with water and/or flavours to make alcoholic beverages or used as fuel

Starch

Native starch, extracted from pulp of crushed roots and dried, can be used as is (in food & beverage manufacturing) or further processed to produce **glucose, dextrins, sorbitol**

High Quality Cassava Flour (HQCF)

Dried cassava chips (8% moisture content) are milled and sieved to produce flour. This cassava flour can then be blended with wheat flour to produce **composite flour** used in pasta and baking/ confectionery

Market opportunity

Significant export opportunity led by Chinese demand, where 4.8Mn MT of dried cassava was imported in 2019 (65% of total global demand)

Industrial processors can **sell by products – peel and fibre to local feed mills**

>200Mn Litres of ethanol is imported to Nigeria annually to support the spirit industry, presenting a **significant import substitution opportunity**.

Biofuel demand is expected to increase across Nigeria in the coming years

FMCGs currently import **>100,000 MT of starch and modified starches annually** (glucose, dextrins, sorbitol). Cassava presents a **cost-effective alternative to these imports** and is ideally placed to capture this **substitution opportunity**

Nigeria currently **imports US\$1Bn of wheat flour** for domestic needs

HQCF can account for up to 14% of flour content in composite flour and presents a **cost effective alternative for bakeries**

The drive to avert food security crisis in Nigeria and remedy malnutrition also presents a different market opportunity with significant social impact



Nigeria is currently experiencing high incidences of malnutrition



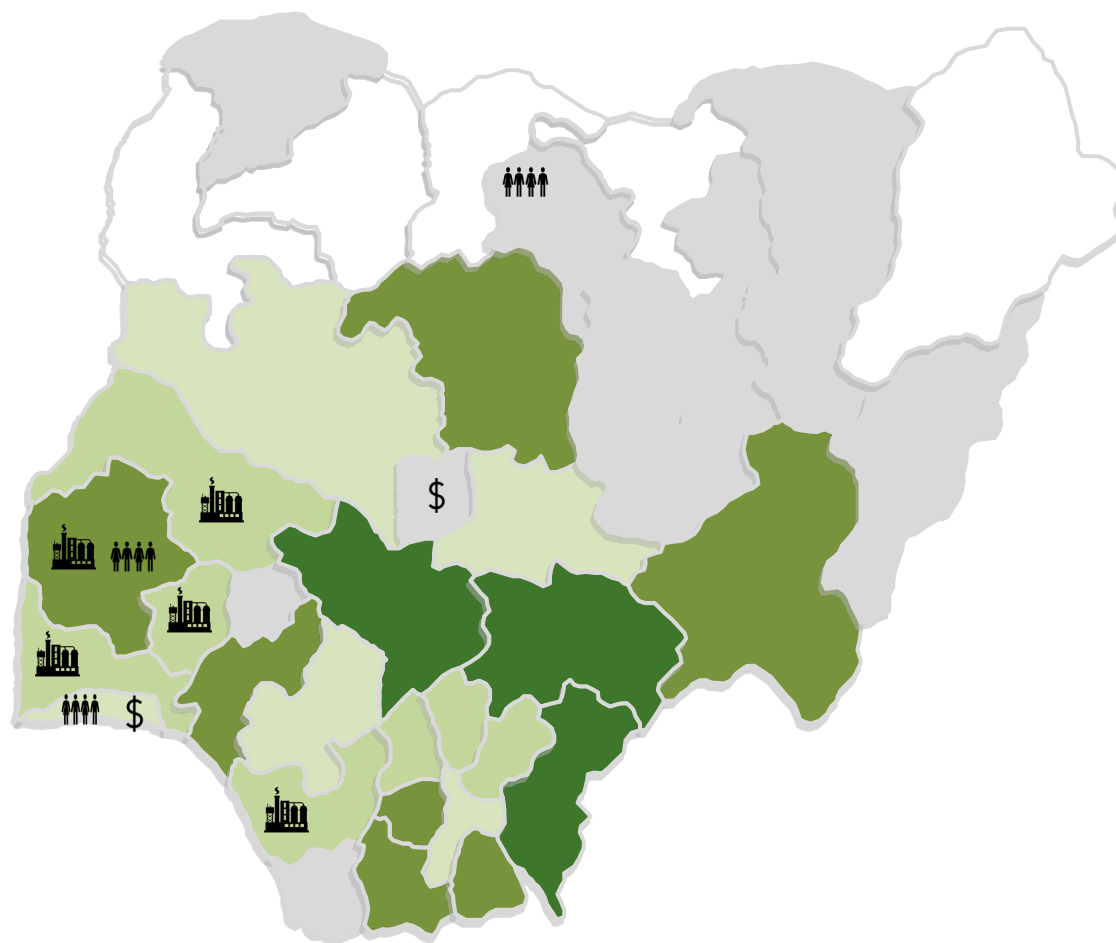
- As a result of the ongoing conflict in northeast Nigeria, there are pressing humanitarian needs to provide access to nutritious food to ~2Mn displaced people
- Acute malnutrition levels in Nigeria have remained between 5-9.9% since 2014, exacerbated by the ongoing conflict
- The World Food Program has identified food access and addressing malnutrition as 2 of the 6 strategic objectives for Nigeria and distributed 6,803MT of food assistance in 2019
- Food assistance includes the provision of foods fortified with essential micronutrients i.e. vitamins and minerals to remedy malnutrition

Cassava is a staple food, making it a great candidate for biofortification



- Cassava is an extremely nutrient rich crop, containing large amounts of vitamin C, thiamine, riboflavin and niacin
- As cassava supply is so plentiful, it is often the cheapest source of calories available to Nigerian consumers
- Cassava's nutritional value, plentiful supply and low costs mark it as an ideal candidate crop to supply nutrients to Nigeria's most deprived population segments

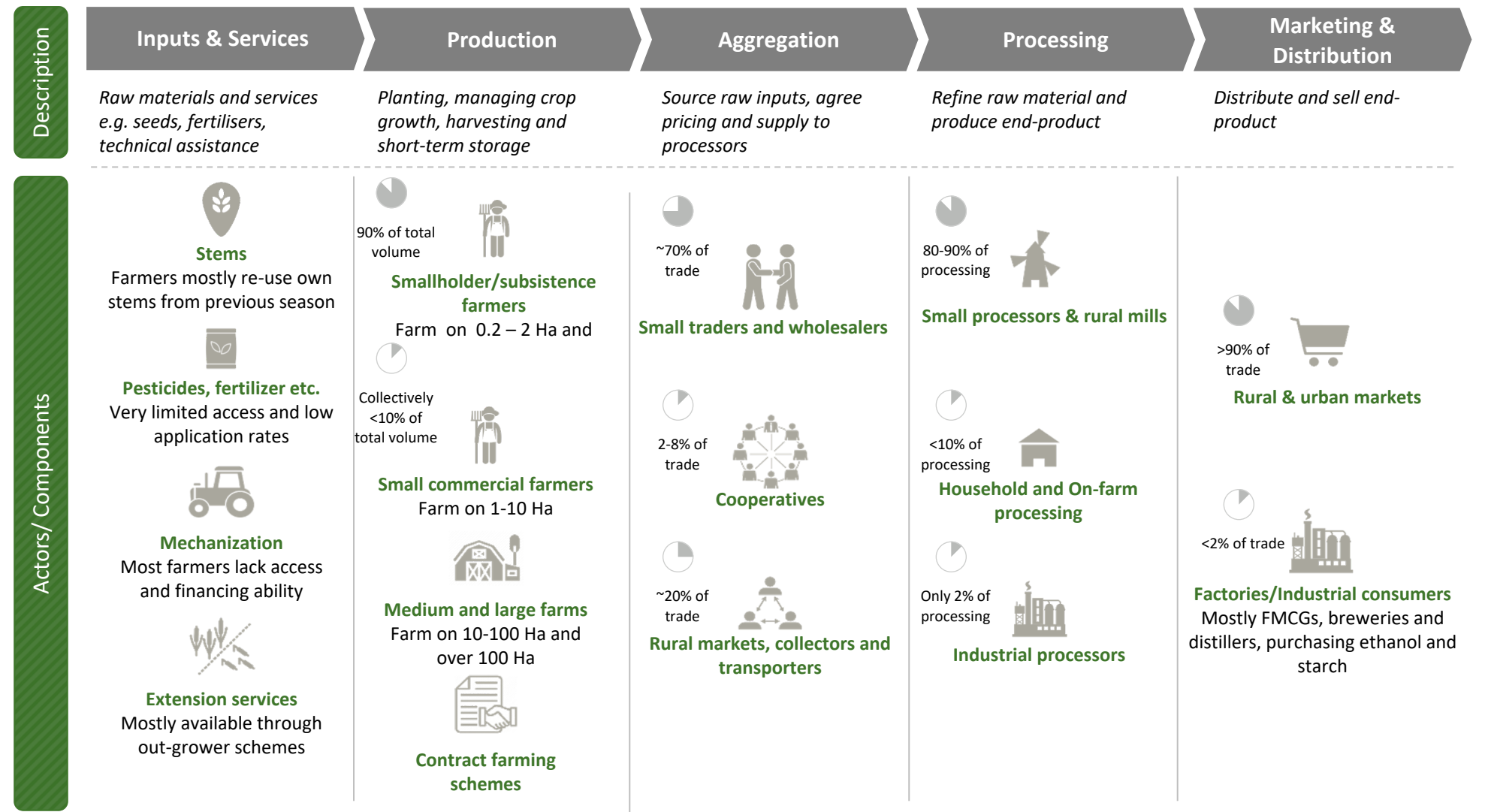
Production is generally small scale today, with small holder farmers producing more than 90% of cassava produced nationally



Key	Areas
Industrial processors	Delta, Osun, Oyo, Kwara
With cities >3M population	Lagos, Kano, Ibadan
With highest earners (>\$4K annual income per person)	Lagos, FCT Abuja
> 2.4M tons cassava production volume	Kogi, Benue, Cross River
1.2M -2.4M tons cassava production volume	Kaduna, Taraba, Akwa Ibom, Rivers, Imo, Ondo, Oyo
601K-1.2M tons cassava production volume	Kwara, Ebonyi, Delta, Ogun, Osun, Enugu, Anambra, Ebonyi
301K-600K tons cassava production volume	Edo, Niger, Nasarawa, Abia
<300K tons cassava production volume	Sokoto, Yobe, Kano, Adamawa, Bauchi, Plateau

The cassava-growing belt falls mainly within three agro-ecological zones of the southeast, southwest and the central areas. The first two zones fall within the humid tropics. The central zone lies between the southern and the drier northern agro-ecological zones

The Nigerian Cassava sector has a few large scale operators, though the sector as a whole is sub-scale and could benefit from professionalization and formalization



While cassava is a major industry in Nigeria, and provides significant revenue opportunities, there are a number of considerations for investors



Key considerations	Description	Impact on value chain				
Limited access to adequate farming inputs	Nigeria's cassava yields today are considered low by international standards due to a lack of access to the appropriate farming inputs such as improved seed varieties, herbicides and fertilisers	✗	✗			
Inefficient farming methods	Farmers often employ inefficient farming methods due to a combination of lack of knowledge and limited incentivization. Addressing these practices will increase product yield, accelerate growth in the sector and increase profitability across the value chain	✗	✗			
Inconsistent prices for cassava	Raw cassava has a shelf life of 48 hours before it spoils once extracted from the ground. This time sensitivity means cassava farmers are subject to market conditions at the time of selling		✗	✗		
Untapped local and export industrial market	Nigeria currently converts 98% of cassava production to low-value food-grade products for domestic consumption, neglecting a significant opportunity for the industrialization of cassava derivative products that may be supplied to both the domestic and international markets				✗	✗
Low factory utilisation rates	Large processors struggle with maintaining consistent supplies of fresh cassava at low cost, and as such underutilize their processing capacity. Utilisation rates are low, compared to international standards				✗	

Note: this list is focused on challenges within the value chain, excluding more cross-cutting challenges

We see five primary investment opportunities to address value chain challenges and open new markets for Nigerian cassava



Opportunity		Objective
1	New markets: Large-scale cassava derivative production – starch, ethanol, sorbitol, and fortified foods	With a wide variety of potential cassava derivatives that may be produced, there are substantial processing opportunities in Nigeria. There is also an opportunity to fortify cassava roots with micronutrients to serve the growing market for fortified foods
2	Out-grower networks	Investing in out-grower farming schemes that increase access to quality inputs, mechanization and technical assistance for farmers can address agricultural inefficiencies and increase outputs
3	On/near-farm semi-processing facilities	Investing in proximate semi-processing facilities can lower losses and reduce operation costs of transportation while optimizing sale prices due to the value-add
4	Large-scale processor with improved operational efficiency	Improving the efficiency of large-scale processing through contract farming schemes and renewable energy production will help processors meet demand for cassava derivatives
5	Technology enabled services – payments and aggregation platform, with crop insurance add-on	Develop or invest in existing technology that allows aggregators and offtakers interact with smallholder farmers, providing a market, stock management and payment platform, with crop insurance or other relevant add-ons

Opportunities are detailed in the following section

Nigeria Cassava Investment Opportunities

- 1 Nigeria Cassava Overview
- 2 Nigeria Cassava Investment Opportunities
- 3 Case studies
- 4 Investor Services

1 New markets: Industrial products and fortified foods

Opportunity impact on the value chain:



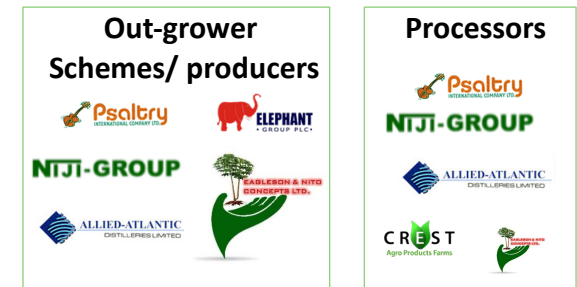
Current issue: Low value-addition

- **Nigeria currently neglects a significant opportunity for the production of industrial-grade cassava derivatives** that may be supplied to both the domestic and international markets, currently converting 98% of cassava production to low-value food-grade products

Opportunity: Produce cassava derivatives and tap into fortified food demand

- **Industrial products are significantly higher value than basic food products**, presenting a strong investment opportunity with increasing demand both domestically and internationally. **Investors can consider a variety of investment options from acquisitions to establishing new entities to produce cassava derivatives**
- **A number of Nigerian cassava processors are already embracing the market opportunity**, moving towards producing greater volumes of industrialized products such as sorbitol, ethanol and starch, over traditional food-grade products, reflecting the industry's appetite for growth and expansion
- While a number of cassava derivatives can be produced with minor modifications to existing plant infrastructure, certain products require more significant upfront CAPEX investments. For instance, moving from starch and flour production to sorbitol requires investment in energy supply, water supply and working capital to purchase catalysts and enzymes. **There are a number of partnership opportunities** for investors to align with existing processors requiring CAPEX investments to fuel their growth
- **There is also an opportunity to fill an emerging demand for fortified foods** – cassava can be fortified with vitamin A and sold to offtakers like the World Food Programme

Key players



Key Activities

- Sourcing raw materials (e.g. fresh cassava roots)
- Processing
- Cassava derivative production

2 Out-grower scheme to improve production volumes and quality

Opportunity impact on the value chain:



Current issue: Inefficient and low-yielding farming practices

- **SHFs frequently adopt inefficient farming methods** due to a combination of lack of knowledge and limited incentivization to improve yields due to price fluctuations for cassava.
- **Limited access to inputs** (due to finance and lack of last mile delivery) also restrict usage and lower yields.
- **High cost of tractors and equipment leads to low mechanization** which increases production inefficiency and limits farmers' ability to plant larger volumes of cassava

Opportunity: Improve production volume and quality through out-grower scheme

- **An out-grower scheme provides certainty to farmers** both in terms of off-take demand, quality and pricing, increasing the attractiveness of growing cassava and incentivising higher yields per ha
- **SHFs can be engaged through out-grower schemes to standardise farming approaches and improve efficiencies.** Extension officer support can help SHF address inefficiencies through education programs on improved farming practices
- **Tailored financial products** can help SHFs with significant CAPEX investments e.g. tractor purchasing and the out-grower scheme helps farmers share the cost burden of these investments
- The collective impact of these interventions is an efficient agricultural process from ground to aggregation, improving profit margins for both SHFs and the out-grower scheme operator

Key players



Key Activities

- Farmer groups organisation
- Design, funding and execution of extension services programs
- Mechanisation

3 Near-farm semi-processing facilities to reduce loss and increase farmer earnings

Opportunity impact on the value chain:



Current issue: Poor cassava post-harvest handling

- **Raw Cassava has a short shelf life** of 48 hours before it spoils once extracted from the ground.
- **This time sensitivity means cassava prices are subject to market conditions** at the time of selling, with farmers frequently facing disadvantageous pricing from aggregators and co-ops who know that if a farmer is looking to sell raw cassava they have limited options available to them
- **Farmers also incur high transport costs** due to their remote location and distance from buyers e.g. processors or aggregators

Opportunity: Invest in proximate semi-processing facilities to lower operation costs and stabilise pricing

- **Semi-processing of raw cassava** can extend the shelf life from 48 hours to 7 days
- **Investing in semi-processing facilities in strategic locations** to maximise reach allows farmers refine raw materials, thereby preserving them. This results in a smoothing out of overall cassava demand and ensuring more consistent pricing
- **Semi-processing facilities also allow for consolidation of inputs and delivers economies of scale** by transporting in bulk, lowering distribution costs and improving overall profit margins for farmers
- The cost of one semi-processing unit is **~50k USD**

Key players

Farm scheme operators



NTJI-GROUP



Key Activities

- Purchase of cassava at farm gate or from aggregation centres (e.g. rural markets)
- Storage
- Use in own processing facility of on-selling to processors

4 Energy - and cost-efficient industrial processing



Opportunity impact on the value chain:



Current issue: Expensive and inefficient processing

- Processors struggle to supply consistent outputs at the quality and quantities required. This inconsistency has repercussions both upstream and downstream in the value chain, alongside impacting the processors ability to invest internally and improve operations
 - Operations** – Costs are high due to processing inefficiencies and a lack of infrastructure investment
 - Upstream** – Inconsistent demand means farmers are not incentivized to invest in improving yields and improving cassava quality
 - Downstream** – Lack of off-take agreements from large FMCG organizations as consistent supply cannot be guaranteed

Opportunity: Stabilise supply and lower operational costs

- Through contract farming, processors can define quality standards, project quantity demands and associated pricing structures, leading to stability and consistency in cassava supply. For example, AADL was able to contract between 4-5,000 smallholder farmers as out-growers and supply 80% of their plant's requirements
- With scaled cassava production in place there is **an opportunity to utilize cassava biomass energy** from waste materials as an alternative to costly on-grid or generator based power supply

Key players

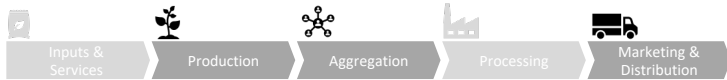
Processors



Key Activities

- Sourcing raw materials (e.g. fresh cassava roots)
- Processing
- Cassava derivative production

5 Technology enabled services for aggregators and offtakers



Current issue: difficulty managing farmer relations

- **Remote location of farmers** makes it difficult for aggregators or offtakers to interact directly with them to purchase or make payments for crops
- **Inability to accurately forecast harvest/stock availability** presents a planning challenge for aggregators/offtakers
- **Farmers preference for cash payments** given their financial exclusion or distrust in financial services. Given high cost and risk of cash handling, payment can be a tedious task

Opportunity: Invest in technology platform for aggregator/offtaker and farmer interaction

- **Develop or invest in technology platform** that serves aggregators and offtakers, providing:
 - Stock management platform to support aggregators/offtakers purchase planning
 - Market platform for purchase of produce
 - Payment platform for payment to farmers
- **Add-on other financial products** such as crop insurance, micro loans to farmer groups, or through the aggregators/offtakers. This improves value-add to the farmers, potentially increasing loyalty of existing participants and attracting new joiners

Key players



Key Activities

- Provision (or utilisation) of fintech (payments, loans)
- Provision (or utilisation) of technology powered market place

Case studies

- 1 Nigeria Cassava Overview
- 2 Nigeria Cassava Investment Opportunities
- 3 Case studies
- 4 Investor Services

Wide range of businesses and actors across the entire rice supply chain, with several players operating across the value chain verticals



** NOT EXHAUSTIVE*



Case study 1: Psaltry International



Inputs & Services

Production

Aggregation

Processing

Marketing

In the past 10 years, Psaltry have developed an out-grower network of 3,500 SHFs who supply cassava

Inputs & Services

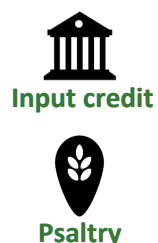
Farming

Aggregation

Processing

Quality & Retail

Jan – March
(farmer recruiting period)



March – October
(planting season)



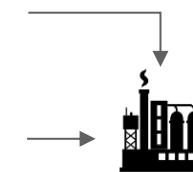
550 Independent
marketers



4 Psaltry
Nucleus farms



44 Cooperatives



2 Processing lines



7 Global clients



3 Local cash
and carry

- Psaltry provides 20% of inputs to SHFs including: stems, herbicide¹, and fertilizer
- SHFs purchase the remaining 80% of inputs; with grade A farmers able to access input credit
- IDH² trains farmers on good farming practices³ and record keeping

- There are 3 grades of farmers:
 - Grade A: >5 ha (10%), >3 seasons
 - Grade B: 2-4ha (40%), 2nd season
 - Grade C: <2 ha (50%), 1st season
- SHFs on 3,500ha of land supply 15% of cassava volumes
- Psaltry Nucleus farms of 700ha supply 45% of cassava volumes

- Cooperatives negotiate prices with Psaltry
- Psaltry extension officers alert SHFs of when to harvest – with a 48 hour window to harvest and load on trucks
- Independent marketers also supply Psaltry with 40% of cassava volumes annually

- Cassava is inspected for starch content (>16%)
- Next Psaltry clean, cut and mill the cassava into slurry
- Cassava milk is extracted; purified, and dried into flakes, and finally into starch or flour
- Waste is recycled to fuel for boilers

- After microbial load tests, cassava starch is sorted for food-grade/non-food-grade
- Afterwards the marketing department distributes cassava starch/flour to their clients (own transport is used)

Note: 1. The herbicides used have Atrazine which is considered best practice 2. Prior, 2SCALE led 5-year capacity program for SHFs, 3. Farmers are trained on using quality inputs, safe use of agro-chemicals in weed and disease control; Integrated Pest Management (IPM) techniques; Stem propagation and post-harvest handling

Sources: Stakeholder interviews; Dalberg analysis

Case study 2: Atlantic Allied Distilleries Limited (AADL)



Inputs & Services

Production

Aggregation

Processing

Marketing

AADL is the only ethanol producer in Ogun state, Nigeria and works with 4,000-5,000 smallholder farmers

Inputs & Services

Farming

Aggregation

Processing

Quality & Retail

March – October
(planting season)



- Farmers in the out-grower scheme, receive technical assistance through 30 field staff functioning as extension workers
- AADL facilitates access to inputs and improved varieties

- SHFs under an out-grower contract cultivate 5,000 ha within 100 km radius
- They grow improved varieties with 22-25% starch content (in some seasons as high as 27%)
- Contract farmers supply 80% of daily requirements of 225-250 MT of fresh cassava root

- AADL company owned vehicles that bring cassava from farms
- Product demand is assured for SHFs ahead of harvest
- AADL pays a price premium of \$2.50/MT per additional 1% starch content above 20%

- Installed capacity of 9 M litres of ethanol and 6,000 MT of liquid CO₂ as byproduct p.a
- AADL plans to expand ethanol production capacity to produce 25% of Nigeria's ethanol requirements by 2022

- 80% of ethanol produced is consumed by Lexcel group
- The rest is taken by breweries
- AADL supplies 4% of the 400 million litres of ethanol consumed by Nigeria annually

Investor Services

- 1 Nigeria Cassava Overview
- 2 Nigeria Cassava Investment Opportunities
- 3 Case studies
- 4 Investor Services

Services to UK Investors

The UK government provides multiple strands of support for UK companies looking to invest in these countries and the broader Africa region.

This includes, but is not limited to:-

- Advice & guidance on market entry, including introductions to country government officials, advice on consultants, any joint venture partners, information on legislative and political risk issues, including managing corruption.
- Financing (debt & equity) including long term patient capital from UK's Development Finance entity – CDC and other development finance institutions
- Overseas Investment Insurance
- Training & linkage development with local input suppliers
- A new UKAid programme, FDI Africa, that will offer transaction facilitation services in due course including for Nigerian investments.

For further information on the full suite of UK support available to your firm please contact:
Department for International Development GrowthGateway@dfid.gov.uk

The DIT Africa Trade Services Unit (TSU) - DIT.Africa@fco.gov.uk

Specific UK officials in Nigeria:

DIT: Lami Adekola lami.adekola@fco.gov.uk

DFID: Manufacturing/agriprocessing Grace Cramer G-Cramer@dfid.gov.uk

Agriculture: Bola Karimu b-karimu@dfid.gov.uk or Gail Warrander g-Warrander@dfid.gov.uk

Energy and Infrastructure: Rob MacIver R-MacIver@dfid.gov.uk

General: Gail Warrander g-warrander@dfid.gov.uk

Innovation and Tech: Leanne Jones leanne-jones@dfid.gov.uk



Contacting NIPC

Nigerian Investment Promotion Commission (NIPC)

Hours: 0900 - 1700

+234 (09) 290 0059

+234 (09) 290 0061

Email:

infodesk@nipc.gov.ng;

osicinfodesk@nipc.gov.ng

Website:

www.nipc.gov.ng

<https://www.theiguides.org/public-docs/guides/nigeria>

<https://www.facebook.com/nipcng>

<https://twitter.com/nipcng>

https://www.instagram.com/nipc_ng/



**NIGERIAN
INVESTMENT
PROMOTION
COMMISSION**

Acknowledgments & Disclaimer



This material and the analysis contained herein (the Report) was prepared by Dalberg Advisors in collaboration with Coffey International Development (Coffey) for the Department for International Development (DFID) on behalf of the Nigerian Investment Promotion Commission (NIPC) (together the “Parties”)

The analysis and opinions contained in the report are based on information provided by Industry professionals and from other primary and secondary sources. The Parties have not audited or verified this information and make no representation or warranty, express or implied that such information is entirely accurate or complete. No legal, environmental, financial operational or physical due diligence has been conducted concerning the subject companies. Forward looking statements and estimates contained herein are based on information described above and the Parties own judgement. These pieces of information should not be construed as definitive predictions or forecasts. This report does not propose to address all risks and challenges

The parties do not have any duty to update or supplement any information in the Report. No responsibility or liability whatsoever is accepted by any person including DFIC, NIPC or its affiliates and their respective officers, employees or agents for any errors or omissions in this report save insofar as may be expressly agreed in writing.

This report does not constitute i) an offer or solicitation to purchase or sell any securities or assets or ii) a recommendation to purchase or sell any securities or assets. It is not financial advice. Each potential participant in the financing of any transaction concerning the subject company should make their own independent assessment of the investment

Due to US regulations, the information in this brochure is not aimed at, nor being made available to US companies or in the USA.



NIGERIAN
INVESTMENT
PROMOTION
COMMISSION

Dalberg