Industrialization of Cassava in Africa: The Case of Nigeria

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Outline

• The Cassava Transformation Agenda
• Challenges of industrial-scale cassava processing
• Building robust cassava supply chains
• R&D Support
• Conclusion
Cassava Production in Nigeria

- World’s largest producer of cassava with 53million MT in 2013
- Good climatic conditions of 1100-2200mm rainfall spread across 6-7 months of the year and temperatures between 24 and 35°C.
- Good soil conditions of well-drained sandy loamy soils with pH of 6-7
- No winter period and the crop can be harvested year-round
- Commercial yields under ideal conditions in Nigeria range from 28-40ton/Ha but average yields are 12MT/Ha
Cassava Production Zones of Nigeria

Source: Akoroda et al. 2010
Cassava Is Predominantly Used as A Staple Meal in Nigeria Garri

• Largest value-added chain, in terms of volume; an estimated 70% of all cassava produced

• Potential demand: 4-4.5 million tons of Garri or 26 – 28 million tons of fresh roots/annum growing at 3%

• Dominated by house-hold, village-level processors and trade intermediaries that are typically short value-added chain

• Garri Value chain offers the highest return on investment to farmers and processors

• Inelastic demand; hence cyclic glut every three years

RTEP Garri processing center
No. 1 Challenge of Cassava in Nigeria: Demand Inelasticity due to a Single Dominant Market (Garri)

Source: Dalberg Cassava Study 2015
Some Other Challenges have Limited Progress in Cassava Developments

- Low productivity due to limited use of improved varieties, agro inputs, poor weed control, and weak demand
- High production costs due to manual production of cassava, and high transport costs of fresh roots
- Small (0.5-1Ha) fragmented holdings that make tractorization difficult
- Medium to large scale mechanized farming have often being fraught with problems of soil erosion and low yield
- Short-term opportunistic relationship between producers and medium to large scale processors
- Based on all the aforementioned, there has been a dearth of medium to large scale factories
Nigeria’s Cassava Transformation Agenda (CTA)

**Promote Industrial Use of Cassava**
Transform cassava from a traditional food crop to an industrial crop

**Raise Cassava Production/Productivity**
Add 17 million metric tons of fresh cassava roots to the domestic supply by 2015 from a base-line of 36 million metric tons;

**Create Jobs**
Over 1.2 million direct and indirect jobs by 2015

**Create Wealth**
Raise income of 1.8 million target farmers by US$450M by 2015
CTA’s Vision of Success

**High Quality Cassava Flour (HQCF)**
- Replacement of 20% wheat flour in bread, snacks, and confectionaries; 0.6 million MT of HQCF, a fresh root equivalent of 2.4 million MT

**Native and modified starches**
- Meet domestic demand for 250,000 MT per year native and modified starches; a root equivalent of 1.0 million MT

**Sweeteners - High Fructose Cassava Syrup (HFCS)**
- Replacement of half of imported sugar by HFS from cassava; 100,000 MT demand of HFS, a fresh root equivalent of 0.5 million MT

**Dried Chips/Dried Grits**
- Meet demand for 3 million MT per year of dried chips from China, EU, and US, a fresh root equivalent of 9 million MT

**Fuel Ethanol**
- Replacement of 50% of 1.75 billion liters of cooking fuel (kerosene, charcoal, and wood) with fuel ethanol from cassava; current capacity, a fresh root equivalent of 7 million tons
An 20% Cassava-Wheat Composite Flour Policy: Unlocking a $0.6 Billion Domestic Market Opportunity

- Nigeria imports 4 million MT of wheat every year at a value of nearly $3 billion
- Partial replacement of wheat leads to significant savings
Building the High Quality Cassava Flour (HQCF) Value Chain

- Can serve as partial replacement (20%-40%) for wheat flour in bread and confectionaries; potentially a 1.2 million MT market or >US$1 billion savings
- Expand production of high quality cassava flour (HQCF) from 160 MT/year to 1.2 million MT/year
- Establishment of 18 private sector-owned large scale cassava flour processing plants
- Organization of clusters of farmers around each HQCF millers and signing of offtake contracts
- Development of a network of bakers and other end-users around the HQCF Mill
- Training of processors on supply chain management.
- Established a Cassava bread development fund to expand HQCF processing capacity, strengthen primary production, and train bakers
A New Composite Flour Brand has been Launched by the Wheat Milling Industry

- **Launch of Composite Flour Products** (The two largest millers in the country, that account for 70% of all flour have launched a 10% cassava composite flour)

- **Higher Gross Return for Bakers.** Bakers who use the composite flour wheat make 20-30% higher margins because of greater dough yield due to higher water retention capacity of cassava flour
N10 Billion ($63 Million) Cassava Bread Fund Fast-tracked adoption by 1,400 Smaller Master Bakers of 20% Cassava Bread Across the Country
Building the Starch and Sweetener Value Chain

- Native, modified, and enzymatic products of cassava starch are in demand in the food and beverage markets.
- A 250,000MT starch market in Nigeria that is currently met by <10% domestic production and the rest by import.
- Commitment by private sector to build one 75,000MT starch factory in Alape, Kogi States.
- Federal Government has designated the Alape locations as Staple Crop Processing Zone (SCPZ) for cassava.
- Establishment of supply chains, of small, medium, and large farms is ongoing.

Cluster of processing plant in Russia similar to what is planned for Alape SCPZ, Kogi state.
Key Enabling Intervention: Establishment of a Network of Mechanized Cassava Farms

• Working with Brazilian farmers, a network of mechanized cassava farms is being established to supply medium and large processing plants.

• Special emphasis is being paid to locations of proposed large scale HQCF and starch mills; 500-1000Ha farms are being established.

• Under the cassava bread fund a total of 5,000Ha are being established in 10 States across Nigeria, in collaboration with IITA, NCAM, AATF, and NRCRI, in support of HQCF (one location for starch). Similar efforts will be started for dried chips, and fuel ethanol.
Large-scale mechanized cassava farming is underway on 5,300 ha in 10 states to ensure cost-effective production.

Abraka, Delta State
Yields of over 25MT/HA translate to fresh root cost of $40/MT of feedstock that ensures a profit for the farmer and competitive flour cost for the miller
High cassava productivity makes cassava attractive to the private sector as feedstock and serves as driver to a viable cassava industry.
Conclusion and Summary of Achievements

• Between 2011 and 2014 and as a result of CTA, cassava processing capacity expanded 620% in new or upgraded starch, HQCF, and ethanol processing plants.

• Four new industrial scale plants (20-60MT/day) – three for starch and one for ethanol were commissioned during the period, while forty small and medium-scale enterprises (SMEs) producing HQCF were upgraded from 1 MT/day to 3 MT/day capacity.

• Another eight plants (60-100MT/day) – five HQCF, two starch, and one glucose have been ordered or close to being ordered.

• More than 80,000 farmers mostly within the vicinity of these processing plants received 130.59 million stems of improved varieties (at 100% subsidy) and over 160,000 fifty-kilogram bags of fertilizer (at 50% subsidy).

• A total of 1,300 hectares of medium-sized mechanized farms were also established at locations of existing or new industrial scale plants.
THANK YOU!