

# Overview of Nigerian Cassava Diamond Analysis

## LOW

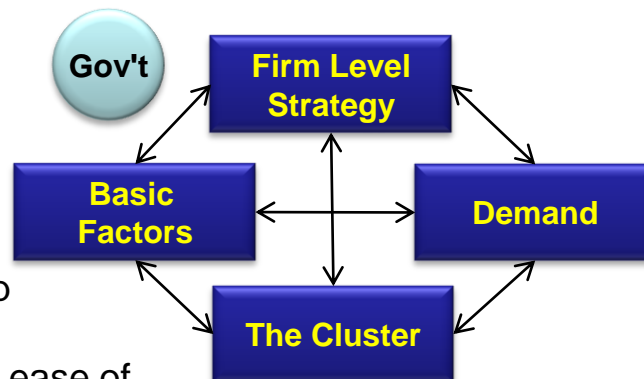
- Lack of consistent focus on agriculture
- Difficult macro-economic driven by over-valued currency
- Visible examples of failure to implement policy limits the market confidence in government support
- Strong perceptions of political corruption and graft
- Lack of clear coordination between federal and state governments
- + Substantial capital to invest

## LOW

- Unclear land rights / ownership
- Very low average yield/Ha
- Highly elastic supply driven by ease of crop substitution
- Highly cyclical production over a 3 year period
- Lack of commercial scale management capacity
- Commercial processors can't source consistent supply
- ± Commercial producers and research stations have both demonstrated globally competitive yields, but limited application of technical knowledge by rural farmers

## LOW / MEDIUM

- No counter-cyclical production behavior
- No historical success of processor backward integration
- Transport costs favor local markets over a single national market
- + Geographic distribution of commercial processors limits direct competition for cassava
- + Receptivity among producers and processors to MARKETS model of coordination



## HIGH

- + Commercial buyers seek substantial and consistent volumes of cassava
- + Domestic food market / production of Gari can be an effective hedge against periods of oversupply
- + Traditional staple food









## MEDIUM

- + Growing interest from banks to support coordinated small scale crop finance
- + Early success of commercial scale farming from outside investors
- + Numerous donor programs in place to provide technical assistance with farmer extension and finance.
- Transport sector is not optimized for cassava, leading to high costs and lost crop value
- Small scale production makes commercial scale supply aggregation difficult

# Critical Investment Promotion Challenges in Cassava

## Solving the Input Supply Chain Challenge

*Improving the competitiveness of the entire agricultural value chain is critical to creating stable and growing markets for the commodities farmers produce*

Challenges Within The Value Chain	MARKETS Support	
<b>Production</b>		
• Crop Finance		MARKETS has been extremely successful at assisting rural farmers with finance, inputs, and extension
• Yield / Hectare		
• Consistent Volume		Long-growing cycle and ease of entry/exit from cassava growing for small scale farmers yields production and price cyclicity every +/- 3 years
<b>Transport</b>		
• “Last Mile” Logistics		Cost of cassava transport doubled by the waiting time for loading of cassava
• Perishability		Commercial value declines substantially 48 hours after harvesting
<b>Processing</b>		
• Energy		Lack of consistent grid power. Price of diesel
• Water		Significant challenge for some producers
• Access to Capital		High commercial rates. Limited interest from banks to lend

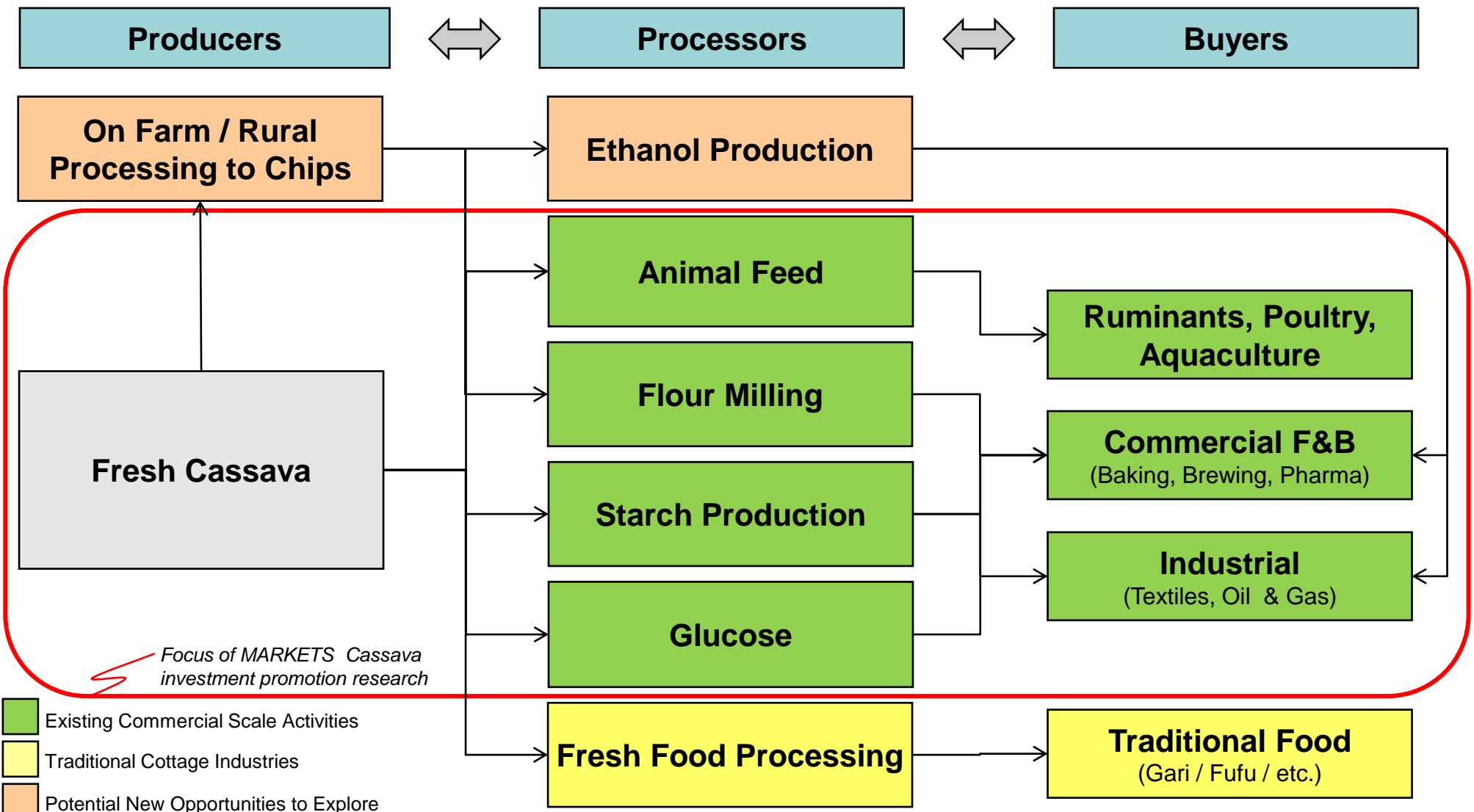
 Current MARKETS support

 Commercial support MARKETS can provide

# Building a Competitive Cassava Industry

## Market Map: Cassava

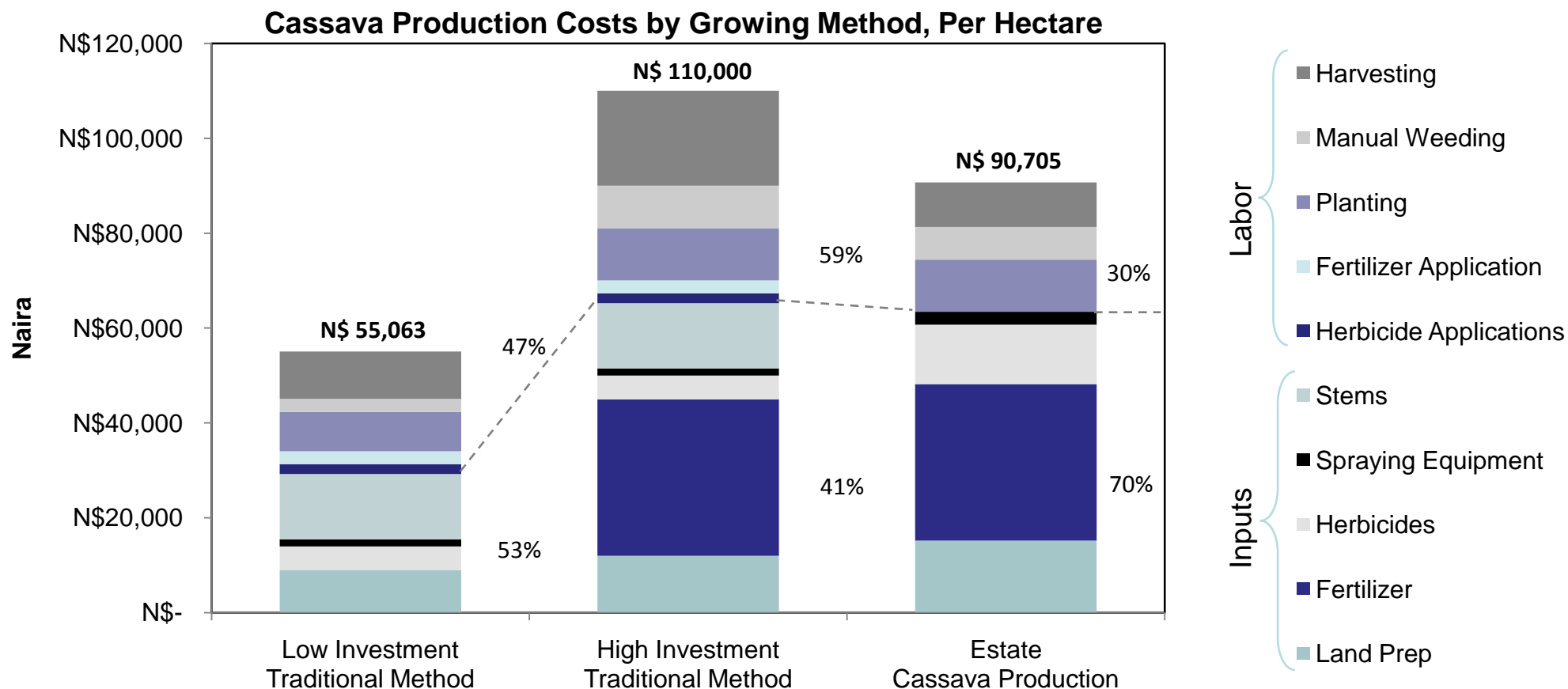
*While there are many uses for commercially processed cassava, the majority of processors want fresh cassava. Chips appear an attractive solution to transport challenges, but the market size and price penalty relative to fresh make it currently unattractive on a large scale*



# Building a Competitive Cassava Industry

## Production: Cost to Produce Fresh Cassava

*Access to finance is a critical factor in supporting farmers ability to engage in improved activities.*



Average Yield / Hectare	10	20	30
Production Cost / Ton	N\$ 5,506	N\$ 5,500	N\$ 3,023
Farmer Income / Hectare	N\$ 65,000	N\$ 130,000	N\$ 195,000
<b>Farmer Profit / Ha</b>	<b>N\$ 9,938</b>	<b>N\$ 20,000</b>	<b>N\$ 104,295</b>

**NOTE:** Ongoing stem costs should drop to zero unless a different varietal is selected. Harvesting is labor only for LIT and HIT production and are calculated based on yield per hectare; Estate harvesting is combination tractor and labor and is calculated on area only. Assumes selling price of N6,500 / MT.

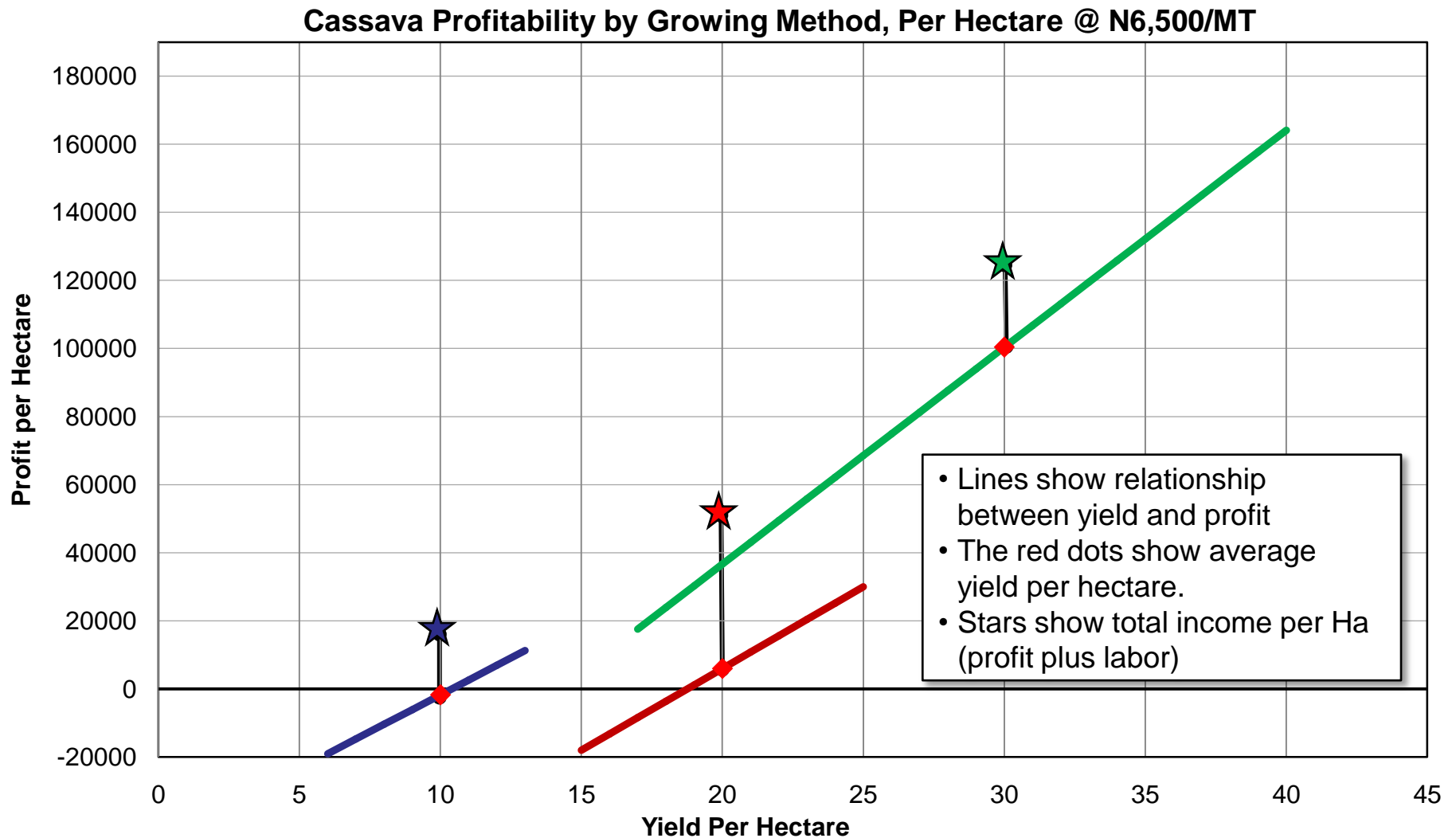
**SOURCE:** Producer and processor interviews; MARKETS production cost model

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# Building a Competitive Cassava Industry

## Production: Farmer Profitability per Hectare

*With improved (and more expensive) effort, comes greater reward, but potentially greater risk.*



NOTE: data based on cost bars from previous slide. Each line represents the profitability at a given yield per hectare. Red Diamond indicates average yield per growing method. Top line represents profit at farm gate. Model assumes farmers pay for transport to a local market or a local cassava aggregation "depot" <10Km from farm.

SOURCE: Producer and processor interviews; MARKETS production cost model

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# Building a Competitive Cassava Industry

## Transport: High Cost to Move Cassava

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*“I did an analysis and don’t see how anyone can competitively transport fresh cassava more than 30Km. At that point, the transport costs exceed to the product value”*

**Commercial Processor**

*“I pay more to transport the cassava than I do to buy it.”*

**Commercial Processor**

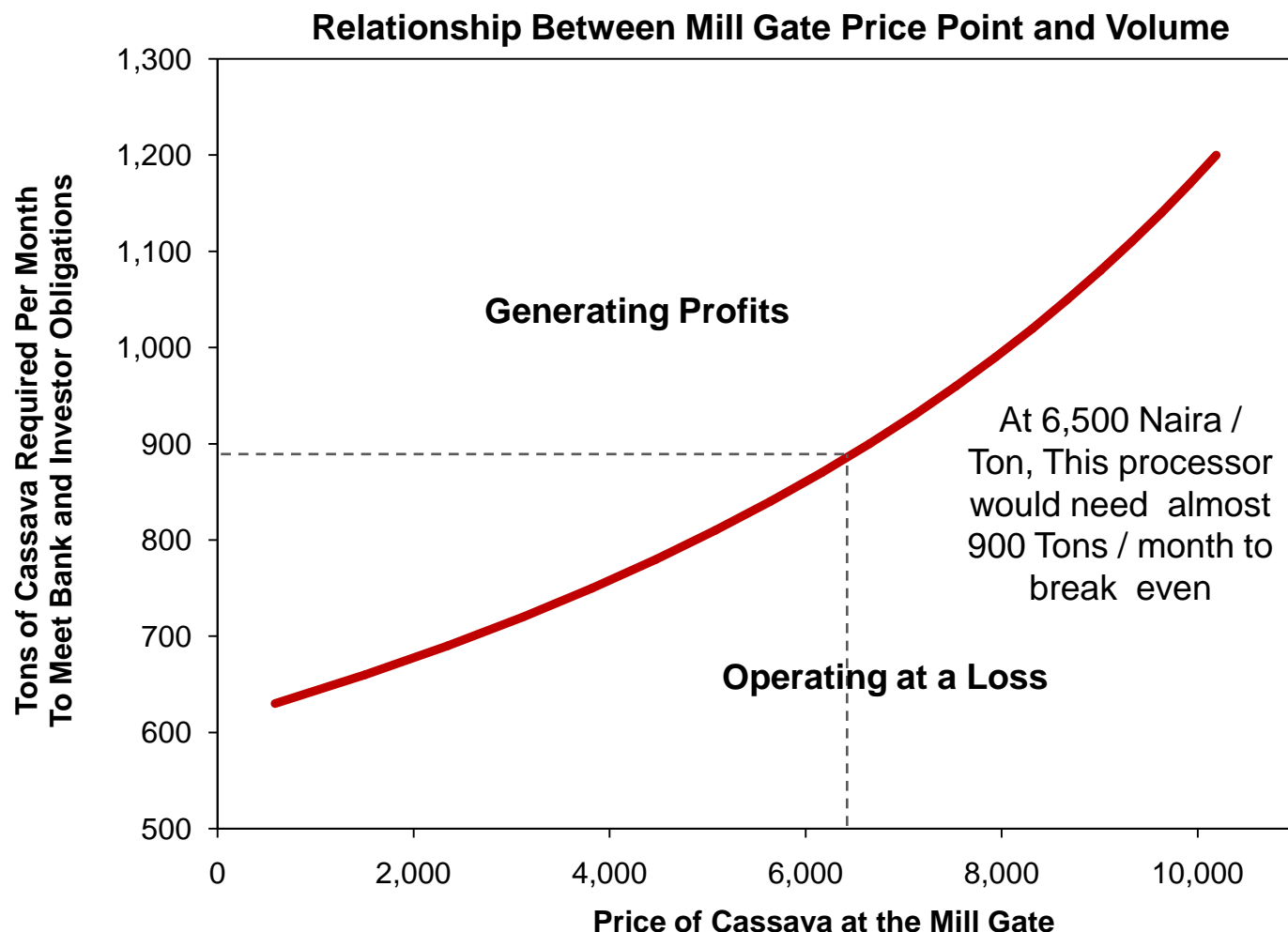
Fuel Costs	<ul style="list-style-type: none"><li>• Fluctuations in fuel costs are passed on directly to the farmers or processors</li></ul>
Product Density	<ul style="list-style-type: none"><li>• Cassava has low value / weight due to 70% water content. Commercial processors show no interest in dry cassava</li></ul>
Availability of transport	<ul style="list-style-type: none"><li>• Current transport utilizes ad hoc contracting of empty trucks headed south. Consistent supply of cassava to processors will require a more formal system</li></ul>
Transport Time	<ul style="list-style-type: none"><li>• Loading of cassava is time intensive, especially if farmers delay harvest until truck arrive and truck is required to make multiple stops</li><li>• Poor transport system can cause substantial delays in moving goods over long distances. After accounting for loading time, the transport window to the mill gate is less than 36 hours</li></ul>
Speed (Stable v. Perishable)	<ul style="list-style-type: none"><li>• Poor transport system can cause substantial delays in moving goods over long distances. After accounting for loading time, the transport window to the mill gate is less than 36 hours</li></ul>

Transport limitations favor processing close to farm where possible. New processing investment that is co-located with production will make it increasingly difficult for any processor with significant transport costs

# Building a Competitive Cassava Value Chain

## Processing: Consistency of High Volume Supply is Critical

*Processors in general are carrying very high fixed costs. Therefore, volume is critical as the more product that is produced, the less those fixed costs impact the final unit price.*



**Commercial processors of Cassava need consistent volumes to be profitable.**

**Losses incurred due to limited supply must be recovered when cassava is available.**

**Supply variability limits commercial buyers ability to pay higher prices**

NOTE: This data represents a hypothetical cassava processing company (CassProCo). The factory has a value of 750MM Naira, of which 150MM is bank financed at 16% interest over a 7 year term. The remaining 600MM is from investors who expect a 5% annual return. The assets of the factory are depreciating over a 10 year period. The plant carries 875K Naira / month in fixed labor costs and 139K Naira / month in fixed energy costs. The plant operates in 8 hour shifts and can process 30 Tons of Cassava per shift. The plant only operates when it has the required volume of cassava to run for a full shift. The plant can operate up to 2 shifts per day, 20 days per month. Variable costs per shift to process the cassava are 36K Naira per shift for manual labor, fuel, and specialized inputs. The finished output of the plant is 20% of cassava input (by weight) and sells for 110K Naira / MT. This model assumes complete market uptake of finished product at all volumes produced.

SOURCE: Processor interviews; MARKETS Cassava Production Model  
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# Potential Commercial Support Activities for MARKETS Cassava Opportunities

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*Primary opportunities to expand or connect current value chain. Possibility to extend in to ethanol or more complex products*

Develop a coordinated solution to transport challenges for exiting processors

- Investment by current commercial processors in backward integration into transport
- Attract specialized transport provider to build business / offer targeted

Support rapid expansion of commercial scale farming / estate model

- Attract commercial farming investors to Nigeria
- Package customized out grower support programs optimized for estate models

Attract co-located processing investment

- Single investor or co-located investment with contract buying agreements
- Intermediate processing of cassava roots into a commercial starch or sugar product
- Potential opportunity for ethanol

# Commercial Cassava Processors

## Challenges to Survival and Growth

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### Supply

- Total Available Volume of Fresh Cassava
- Price Stability of Fresh Cassava
- Supplier Capabilities (consistency, commitment to contracts, etc.)
- Transport Logistics / Cost (inbound to Mill)

### Operations

- *Water*
- Energy Prices
- *Skilled Labor*

### Sales

- Buyer Certification
- Transport
- Consistent Policy Environment
- Consistent Supply

# MARKETS Support for Commercial Processors of Cassava Initial Recommendations

## SUPPORT SOLUTIONS

### Long-Term

*(Next year and beyond)*

*Continued Support Against Shocks to the Industry*

**Support for Access to Capital from Strategic Domestic Investors and International Equity and Debt Markets**

### Short-Term

*(This season – next 6-9 months)*

**Cassava Out Grower Support  
Commercial Innovation Fund**

**Market Mapping of Size, Growth Trends, and Purchase Behavior for Key Commercial / Industrial Inputs Derived from Cassava**

**Commercial Innovation Fund**

**Survive**

**Expand**