CASSAVA ENTERPRISE AND INDUSTRY DEVELOPMENT

CASSAVA PRODUCTION, PROCESSING AND MARKETING OPPORTUNITIES IN GUYANA

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Root and tuber crops grown in Guyana

- Cassava, eddo, yam, sweet potato and tannya
- Popular domestic food
- Important source of Carbohydrates

Cassava - most important root crop grown in Guyana.

- Staple food of hinterland communities especially for the Amerindians.
Classified as “Sweet” or “Bitter”

- Boiling is general method of food preparation
- Some amount of processing
  - Tapioca (flour)
  - Bread (including flavored)
  - Farine
  - Casareep
- Occurs at cottage level
  - Beverages (Paiwari, etc).
- Chips and pones for local market
<table>
<thead>
<tr>
<th><strong>Systoms.</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop is known to be:</td>
<td></td>
</tr>
<tr>
<td>➢ Drought tolerant</td>
<td></td>
</tr>
<tr>
<td>➢ Water efficient</td>
<td></td>
</tr>
<tr>
<td>➢ Tolerant to acidity</td>
<td></td>
</tr>
<tr>
<td>➢ Tolerant to low levels of Phosphorous</td>
<td></td>
</tr>
</tbody>
</table>

➢ Thrives where other crops are constrained

In Guyana, it is produced on soils rich in organic matter, loamy soils and sandy loam.

➢ Produced in all regions of Guyana
Table 1: Cassava Production in Guyana by Regions in 2007

<table>
<thead>
<tr>
<th>Cassava Type</th>
<th>Reg. 1</th>
<th>Reg. 2</th>
<th>Reg. 3</th>
<th>Reg. 4</th>
<th>Reg. 5</th>
<th>Reg. 6</th>
<th>Reg. 7</th>
<th>Reg. 8</th>
<th>Reg. 9</th>
<th>Reg. 10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweet</td>
<td>1.6</td>
<td>0.38</td>
<td>1.0</td>
<td>0.94</td>
<td>0.77</td>
<td>0.38</td>
<td>0.12</td>
<td>3.4</td>
<td>0.91</td>
<td>0.03</td>
<td>8.9</td>
</tr>
<tr>
<td>Bitter</td>
<td>3.2</td>
<td>0.84</td>
<td>-</td>
<td>0.47</td>
<td>-</td>
<td>0.21</td>
<td>0.14</td>
<td>2.7</td>
<td>3.6</td>
<td>-</td>
<td>11.3</td>
</tr>
<tr>
<td>Total</td>
<td>4.8</td>
<td>1.22</td>
<td>1.0</td>
<td>1.41</td>
<td>0.77</td>
<td>0.59</td>
<td>0.26</td>
<td>6.1</td>
<td>4.51</td>
<td>0.53</td>
<td>2.002</td>
</tr>
</tbody>
</table>

Regions of highest production - 1, 8 and 9
- Bitter in Larger quantities
- Farm sizes – 0.1 – 2.0 ha
- Mainly as monoculture
- Some intercropping with pineapple
In excess of 70 varieties locally
- Four month, Butterstick, Uncle Mack, Bad woman etc.

- Production practices detailed in farm Manual

- Planting materials are cuttings
  - 0.9m between rows and 0.9m within rows
  - 12,345 plants/ha or 5000plants/a

- Production can be considered “organic”
- Acoushi ants (main pest)

Land preparation – Completely manual or partially mechanized.

Harvesting – Completely manual
**PRODUCTION TRENDS**

Table 2: World cassava production, areas and yield, 2004.

<table>
<thead>
<tr>
<th></th>
<th>Production ('000 tons)</th>
<th>Area ('000 ha)</th>
<th>Yield (T/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>203,618</td>
<td>18,475</td>
<td>11.02</td>
</tr>
<tr>
<td>Africa</td>
<td>108,470 (53%)</td>
<td>12,252</td>
<td>8.85</td>
</tr>
<tr>
<td>LAC</td>
<td>34,727 (17%)</td>
<td>2,696</td>
<td>12.88</td>
</tr>
<tr>
<td>Asia</td>
<td>60,245 (30%)</td>
<td>3,511</td>
<td>17.16</td>
</tr>
</tbody>
</table>

In 2000 – average yield was 10t/ha
In 2004 – average yield was 11.02t/ha
Approximately 2000ha under continuous cultivation
Average production – 23, 540 tons
(Less than 1% of LAC)
Average yield 12.5t/ha
In Asian countries like Vietnam yield increases from 7.53t/ha to 14.53t/ha obtained over a six year period.

Due to

- New high yielding and high starch varieties
- Adoption of improved practices (eg. balanced fertilizers use)
- Soil conservation measures
PROCESSED PRODUCTS
Roots and leaves have multiple end uses

Figure 2: Pathways of processing cassava fresh roots or green tops into a multitude of products used for human or animal consumption or for industrial purposes.
Figure 3: Cassava root processing into value added products (TTFITA, 2000)

- Cassava roots
  - Cassava starch
    - Direct consumption
      - Sago pearls
      - Noodles
      - Traditional desserts
    - Modified starch
      - Acetylated: sauces, frozen food, instant soup, pastries, glue
      - Crosslinked: salad dressing, canned food, sauces, paper, textiles
      - Oxidized: candies, instant soup, salad dressing, paper, textiles
      - Cationic: paper, textiles
      - Alpha: animal feed, mosquito coil, sauces, desserts
    - Sweeteners
      - Glucose/Dextrose: candies, beverages, canned food, medicine, creamers
      - Fructose/high fructose syrup: beverages, pastries, dessert, candies, sauces
      - Sorbitol: toothpaste, cosmetics, vitamin C
  - Cassava chips & pellets
    - Animal feed
    - Alcohol: fuel
    - Citric acid
  - Direct consumption
    - Boiling, roasting
    - Drying: flour
  - Peels & pulp
    - Animal feed
    - Compost
    - Mushrooms
  - Alcohol
    - Ethanol: liquor, industrial and medical alcohol
  - Organic Acid
    - Citric acid
  - Amino acid & derivatives
    - Monosodium glutamate
    - Lysine: animal feed
Main processed products in Guyana – bread, flour, farine, casareep

**Figure 4:** Value added cassava products made in Guyana.
Simplest method of food preparation – boiling
Others are processed before consumption.
(A) Grating cassava
(B) Squeezing using matapi
Documentary on cassava and its by-products produced by North West Organics in 2008. Two processing facilities are at Tapakuma and Surama.

**Figure 5:** Cassava processing factory at Tapakuma.

NB: It takes about 450kg of cassava to make 22L of casareep.
A major constraint in cassava processing has been in the acquisition of appropriate technology inclusive of equipment.

According to Radzik (2004), traditional cassava graters made by inserting flints in wooden boards, and farine griddles made from large flat stones, gave way a century ago to metal graters and farine pans.

The former are still made by punching holes in sheet metal, but mechanized graters demonstrated from time to time, have never been available in Guyana as a manufactured item, and manually grating cassava still occupies a high proportion of Amerindian women’s and girl’s time.
Radzik (2004) further stated that the availability of hand powered mechanical graters and manufactured farine pans would have a profound effect on the efficiency of cassava processing.

This would ensure that women who now spend an average of ten hours every five days grating cassava tubers and making farine and cassava bread would be relieved of much hot unpleasant labour.

Production of farine, and easily stored staple, would increase to improve food security. Cassava now wasted because of the hardship associated with its processing would be beneficially utilized, and increases in production would follow since the limitation on cassava has always been more processing than agricultural (Radzik, 2004).

Efficient processing would open up the possibility of commercialization of cassava products for regional and Brazilian markets.
MARKETING
Most cassava produced is consumed locally

**Table 5:** Exports cassava and cassava – based products from Guyana (1998 – 2006)

<table>
<thead>
<tr>
<th>Cassava/Product</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.47</td>
<td>1.77</td>
<td>0.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cassava bread</td>
<td>0.96</td>
<td>0.37</td>
<td>0.25</td>
<td>0.05</td>
<td>0.06</td>
<td>0.04</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cassareep</td>
<td>4.02</td>
<td>1.61</td>
<td>0.35</td>
<td>0.18</td>
<td>0.59</td>
<td>0.19</td>
<td>0.09</td>
<td>0.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: 'New' Guyana Marketing Corporation

Exports are not in significant quantities
A highly limiting factor affecting the marketing and consumption of cassava in its fresh state is its poor shelf life and high rate of deterioration and spoilage occurring during storage.

Many practices have been developed to assist in improving the postharvest quality characteristics of this perishable commodity.

Cassava production can be considered as “organic”
- Could be an asset in marketing
- Need for certification

North West Organic – products branded as organic
In order to be competitive in the world market, cassava processing in Guyana would need to be fully mechanized.

These would lead to a reduction in the costs of production.

Attention should also be given to the production of modified starch and other starch-based products for which markets exist.

The possibility of using cassava for agro-energy purposes could be explored.

➢ Need to also examine composite flours.
THANK YOU