Cassava processing and marketing: experiences from Ghana

REGIONAL INITIATIVE WORKSHOP
20-22 March 2006
New Coco Beach Resort - Accra, Ghana
Akwasi Adjei ADJEKUM
Enabling the rural poor to overcome poverty
Cassava processing and marketing

• Introduction
  Importance

• Processing
  Problems

• Utilisation (potential)

• Root and Tuber Improvement Programme (RTIP)

• Root and Tuber Improvement and Marketing Programme (RTIMP)
  – Strategy
  – Components
  – Innovative features

• Issues to consider

• Conclusion
Contribution of Various Sub-sectors to Agricultural GDP

- **Roots & Tubers**: 46%
- **Cocoa**: 13%
- **Forestry**: 11%
- **Livestock/Poultry**: 7%
- **Cereals**: 2%
- **Other Crops**: 2%
- **Plantain**: 9%
- **Fisheries**: 5%

*Source: MOFA, SRID 2004*
Problems of cassava

• Highly perishable - short storage life

• Low levels of protein

• Some varieties of cassava contain high levels of cyanogenic glucosides which impart toxicity to the plant

*These problems can be overcome by processing into shelf-stable products, fortification with high protein foods, detoxification during processing*
Importance of cassava processing

• Traditional processing methods produce shelf stable products e.g. *gari, kokonte*.

• Grating, fermentation and other unit operations reduce the level of cyanide in cassava.

• Cassava fermentation by lactic acid bacteria e.g. in *gari, agbelima, akyeke*, improves safety of the product against pathogens, reduce cyanide content, improves nutritional value.

• New cassava products can be developed to expand market for cassava including downstream processing of cassava flour and cassava starch.
USES OF CASSAVA IN GHANA

- Fresh Cassava Roots: 55%
- Gari: 23%
- Agbelima: 18%
- Konkone: 2%
- Chips: 1%
- Industrial (PSI): 1%
Problems of traditional cassava processing

- High labour input – manual operations.
- Unhygienic practices.
- Scattered nature of operations.
- Uneconomical operations.
- Low efficiency.
- Time consuming nature of the processes.
- Lack of quality assurance.
- Poor product packaging
# POTENTIAL UTILIZATION OF CASSAVA IN GHANA

<table>
<thead>
<tr>
<th>Product</th>
<th>Sector using Product</th>
<th>Qty Used (tons)</th>
<th>Product and (level of substitution)</th>
<th>Potential Qty Needed (MT of Product/annum)</th>
<th>Theoretical Mkt Potential (MT of Fresh Cassava/annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat Flour, (Wheat Equiv.)</td>
<td>Plywood Indust. Others (Bread, Biscuits &amp; Snacks)</td>
<td>1,681</td>
<td>Cassava Flour (100%)</td>
<td>1,681</td>
<td>8,405</td>
</tr>
<tr>
<td>Starches (maize, wheat, potato)</td>
<td>Pharmaceuticals</td>
<td>687</td>
<td>Cassava Starch (5%) Cassava Flour/Starch (100%) Modified Cassava Flour/Starch (50%)</td>
<td>34</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Textile Others (Paper, Processed Foods etc)</td>
<td>187</td>
<td></td>
<td>187</td>
<td>935</td>
</tr>
<tr>
<td></td>
<td></td>
<td>380</td>
<td></td>
<td>190</td>
<td>950</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Pharmaceuticals</td>
<td>265</td>
<td>Cassava-derived industrial alcohol (100%)</td>
<td>265</td>
<td>4,732</td>
</tr>
<tr>
<td></td>
<td>Others (medical, beverage, scientific)</td>
<td>9315</td>
<td>Cassava-derived industrial alcohol (100%)</td>
<td>9,315</td>
<td>166,339</td>
</tr>
</tbody>
</table>
# POTENTIAL UTILIZATION OF CASSAVA IN GHANA

### Current/Previously Used Industrial Raw Materials vs. Cassava-based Industrial Alternative

<table>
<thead>
<tr>
<th>Product</th>
<th>Sector using Product</th>
<th>Qty Used (tons)</th>
<th>Product and (level of substitution)</th>
<th>Potential Qty Needed (MT of Product/annum)</th>
<th>Theoretical Mkt Potential (MT of Fresh Cassava/annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose/Glucose Syrup</td>
<td>Pharmaceuticals</td>
<td>35</td>
<td>Cassava-derived glucose syrup (100%)</td>
<td>35</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>877</td>
<td>Cassava-derived glucose syrup (75%)</td>
<td>657.75</td>
<td>3,288.75</td>
</tr>
<tr>
<td>Maize Flour (Maize Equiv.)</td>
<td>Livestock Feed</td>
<td>1,882</td>
<td>Cassava Chips or pellets (10-20%)</td>
<td>1,782.3</td>
<td>8,911.5</td>
</tr>
<tr>
<td></td>
<td>Others (Human consumption and other industrial use)</td>
<td>1,085,002</td>
<td>No Cassava Substitute</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Total Market Potential Demand**: 298,181.25
• In 1999 IFAD supported the implementation of the RTIP with an objective to:

*Enhance food security and increase the incomes of resource-poor farmers by facilitating access to improved but locally adapted root and tuber technologies*
## Varieties Released under RTIP

<table>
<thead>
<tr>
<th>Variety</th>
<th>Average Yield (Tons/Ha)</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eskamaye</td>
<td>15.8 – 22.7</td>
<td>Tuo Zaafi, Gari, Konkonte, Starch, Flour</td>
</tr>
<tr>
<td>Filindiakong</td>
<td>15.5 – 18.3</td>
<td>Tuo Zaafi, Gari, Konkonte, Starch, Flour</td>
</tr>
<tr>
<td>Nyerikobga</td>
<td>16.7 – 28.7</td>
<td>Tuo Zaafi, Gari, Konkonte, Starch, Flour</td>
</tr>
<tr>
<td>IFAD</td>
<td>30.0 – 35.0</td>
<td>Konkonte, Fufu, Ampesi, Agbelima, Gari, Starch, Flour</td>
</tr>
<tr>
<td>Nkabom</td>
<td>28.0 – 32.0</td>
<td>Konkonte, Fufu, Ampesi, Agbelima, Gari, Starch, Flour</td>
</tr>
</tbody>
</table>
## Varieties Released under RTIP

<table>
<thead>
<tr>
<th>Variety</th>
<th>Average Yield (Tons/Ha)</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agbelifia</td>
<td>29.2</td>
<td>Starch (24.4%) and <em>Gari</em></td>
</tr>
<tr>
<td>Bankyehemaa</td>
<td>27.1</td>
<td>Flour</td>
</tr>
<tr>
<td>‘Esam’ bankye</td>
<td>32.8</td>
<td>Flour</td>
</tr>
<tr>
<td>Doku duade</td>
<td>28.2</td>
<td>Starch (24.6%)</td>
</tr>
</tbody>
</table>
Cassava Production in million tons (1993 – 2004)

Some highlights of postproduction activities carried out by RTIP

- Scientific information/literature and technologies generated locally collated and reviewed.
- Socio-economic analysis of marketing, processing and utilization of root and tuber crops was carried out.
- Development and promotion of cassava and sweetpotato recipes.
- Extensive promotion of production and utilisation of HQCF.
- Improved method for yam storage in barns. Training modules for processing cassava into various products.
- Develop GMP, GHP and generic HACCP for production of HQCF.
- Setting up of group owned cassava flour pilot plants
Inadequate marketing channels depressed producer prices
• Follow-up project:
  the Root and Tuber Improvement and Marketing Programme

To enhance incomes and food security in order to improve the
livelihoods of the rural poor in Ghana
Project strategy (1)

• sustainable enhancement of farm level productivity of R&T production (eg. new varieties and improved crop culture)

• working towards increased linkages within R&T commodity chain to ensure ‘pull’ for increased production

• upgrading of processing technologies and marketing skills
Project strategy (2)

- empowerment of small farmer and processors through participation in R&T commodity chain management, policy dialogue and development/strengthening of R&T commodity chain institutions

- involvement of private sector firms and organizations in implementation of RTIMP

- partnership with ‘business development’ NGOs and with IFAD/MES Rural Enterprise Project II and other relevant projects (eg. CBRDP)
Component A: Support to increased commodity chain linkages

• setting up processes, structures and mechanisms to increase demand-led commodity chain integration

• information, education and communication

• linking Small Producers and Processors to larger scale markets

• strengthening of organisations of root and tuber Farmers, Processors and Traders

• support to R&T commodity chain integration and policy dialogue.
Support to R&T production
- to increase adoption of farm technologies through enhanced access

Sub-components:
- Agricultural Research
- PM multiplication and distribution
- Improved R & T cultivation systems
- Integrated Pest and Disease Management
- Soil Fertility Management
Component C: Upgrading of R&T Commodity Chains

Rationale:
• small-scale R&T commodity chains are one of the backbones of the rural economy

Constraints:
• low margins and low profitability for most actors
• limited market opportunities due to mismatch in quality, quantity and price,
• low uptake of improved processing techniques and constraints in raw material availability.

Focus:
• upgrading existing commodity chains which have a high income and employment-generating potential for especially the rural population.
Sub-components of C:

- identification and Promotion of Root and Tuber technologies
- establishment of *Good Practices Centres*
- business development training
- Micro-Enterprise Fund
  - (Matching Grant + Credit, Matching Grant + Micro-leasing)
Instruments of Component C:

- identification and screening of entrepreneurial poor (focusing on existing businesses, both groups and private individuals)

- animating, building the capacities of entrepreneurs in business development and marketing skills

- linking with rural financial institutions models

- main partners: ‘business development) NGOs (eg. TechnoServe, OIC, SNV, World Vision, etc.)
Role of Private Sector

- Extension support especially for processing and marketing
- Technical Service Providers to develop supply lines
- Building their capacity to enable them create expanded markets
- Engineering companies to build appropriate equipment and provide equipment maintenance services (e.g. SIS Engineering, GRATIS, etc)
- Business development training for clients
Innovative Features

• PDIPs as a platform for partnership building, strategic thinking, planning and exchange of ideas

• Integrated commodity chain approach

• Funding of new tailor-made linkages

• FFF as main mechanism to exchange knowledge on
  • Cultivation
  • Soil management
  • Integrated pest management
  • Participatory Varietal selection
  • Identifying the research need of small farmers
Innovative Features

• Build on already developed informal and formal groups to create R&T Apex body

• New lending instruments for financing poor rural entrepreneurs (matching grant and micro-leasing)

• Good Practices Centers
Issues to Consider

• Adequacy of raw material supplies and quality
• Economics of scale (farmers, processors)
• Quality of intermediate processed products from processors:
  • Establish grades and standards
  • Tariffs on competitive / substitutive products ?? – Governmental interventions
  • Support for Trade Associations to enhance the policy dialogue

• Market information and infrastructure
• Support to increased commodity chains (enhancing profitability at all levels)
• Access to credit
• Labeling, grading and packaging
Drudgery of Peeling
Conclusion

- Cassava production and processing have immense potential to alleviate poverty in rural households.
- Processing and processed products can also create employment across the whole spectrum of the economy.

We need to identify solutions that will:

- Add value to the tuber.
- Strengthen access to transport and credit.
- Reduce drudgery.
- Improve food safety and quality.
- Reduce storage and handling losses.
- Increase market access.
Thank You