Cotton and its by-products in Uganda: Analysis of Cotton by Products Survey

A Report to United Nations Conference on Trade and Development (UNCTAD)

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Introduction

1. Cotton remains an important crop in Uganda, ranked as at the country’s third largest export crop after coffee and tea.

2. Although cotton is primarily used for lint, several by-products can be derived to increase value added.

3. These are not well developed as Lint for various reasons including bottlenecks

4. However they present a number of opportunities if well developed

5. To address the bottlenecks to developing the cotton by-products, UNCTAD and its regional partners, UNECA and COMESA designed a project “Promoting Cotton By-Products in Eastern and Southern Africa”. This study has been undertaken as part of the project.
Project Objectives

The overall objective:
Strengthen the capacity of selected countries in Eastern and Southern Africa to assess the economic viability of the development of cotton by-products and formulate evidence-based policies that promote their value addition.

Key objectives are:
1. To improve the capacity of cotton value chain stakeholders to assess the market opportunities for cotton by-products; and,
2. To improve the capacity of policymakers in the beneficiary countries to:
   • (a) formulate evidence-based policies that help to develop cotton by-products industries; and
   • (b) devise investment profiles to attract investors to these industries
Study Objectives

Overall objective
1. To examine and enhance the development of cotton by-products in Uganda.

The specific objectives:
1. Examine the production and marketing dynamics of cotton by-products in Uganda;
2. Identify the main impediments to the development of cotton by-products in Uganda;
3. Assess the infrastructure and technology capabilities and challenges at the different nodes of the cotton value chain;
4. Identify possible opportunities for developing the cotton by-products value chain;
5. Identify strategies and incentives that can motivate cotton by-products actors.
Methodology

1. The research basically applies two methods to collect and analyze data i.e.
   Desk review, field survey and secondary data sources

2. Out of the Zones, EPRC sampled value chain actors in the West Nile region, Northern region, Western Uganda region and the Eastern region

3. We conduct field interviews with actors along the cotton by-products value chain
   • We sampled 25 ginneries and visited 23 ginneries.
   • We interviewed 116 farmers with at least 0.5 ha
   • Visited sampled 6 and interviewed 4 wool producers as 2 were inoperative.
   • For animal feeds, we sampled and interviewed 5
   • For oil millers, out of the 9 sampled we collected data from 6 given that 2 were not functional and the last one milled sunflower exclusively.
   • Associations (UGCEA, UCOPA, TEMAU, TEXDA)
   • Soap makers
   • Textiles farms
   • Government institutions (NARO, UIA, UIRI, MTICs, MAAIF and CDO)

3. Analyzed survey data using stata and created themes for qualitative data
1. Most parts of Uganda have the potential to produce cotton.
Results
A summarized cotton value chain in Uganda

1. By-product
   • Seed cotton
   • Cotton Stalks
   • Cotton seed
   • Milling & oil extraction
   • Cotton seek cakes
   • hull /husks
   • Linters
   • Surgical cotton
   • Soap

2. Opportunities
3. Challenges
4. Policy issues
Factors that influence farmers to grow cotton

- Cotton is not easily stolen or eaten by animals: 1.1
- Cotton stalks are a source of firewood: 0.4
- Cotton destroys weeds that affects other crops: 1.5
- Cotton is relatively drought resistant: 6.9
- Source of government revenue: 1.1
- Provides employment to the community: 4.2
- Cotton is income generating: 34.7
- Cotton provides manure and fertilizes to the soil: 14.9
- Inheritance of cotton growing from parents: 3.8
- Interventions by CDO has raised awareness on the benefits of: 4.2
- There is ready market for cotton: 15.6
- Cotton fetches a better price: 11.5

Impediments at farm level

- Inadequate capital for purchasing inputs: 26.6
- Unreliable weather (drought and a lot of rain): 19.8
- Competition from other crops: 17.9
- Adulterated inputs: 10.0
- Inadequate extension services: 8.7
- Outbreak of pests and diseases: 6.3
- Inadequate land: 3.8
- Poor agronomic practices: 2.5
- Untimely supply of inputs: 1.9
- Liberalization of the sector: 1.4
- Declining soil fertility: 1.1
1. The trends: cotton acreage declined significantly although it is recovering.

2. This is partly attributed to competition from other crops.

3. A profitability: a farmer is likely to earn more from them per acre than cotton.

4. Direct production costs as a proportion of revenue, are 40 per cent for cotton, compared to 11 to 24 per cent for competing crops.
Trends in lint production and value

Trends in seed production and value

Data source CDO
1. Cotton stalks have many potential economic uses if opportunities are explored and harnessed.
2. About 105,000 MT of cotton stalk is generated in Uganda every year.
3. Most of the stalk produced is treated as waste – burnt or used as firewood.
4. According to UIRI, there is a high potential for Uganda to use cotton stalks to make:
   - The carbonized (Charcoal Briquettes - fuel)
   - The non-carbonized pressed into pellets (pressed wood briquettes)
   - Particle boards

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### Imports and exports of particle boards

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<th>2014</th>
<th>2015</th>
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<td>Imports in (MT)</td>
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<td>310</td>
<td>457</td>
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</table>
Challenges

1. Equipment required to process cotton stalks into boards is very bulky and expensive.
2. The stalks are seasonal not ensuring supply throughout the year.
3. Bulking and transportation is a problem (collecting aggregating).
4. During storage, they can be degraded.
Seed cotton production and cotton products trade

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
<th>Trade balance</th>
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<td>2012</td>
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<td>6,133</td>
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<td>2014</td>
<td>6,225</td>
<td>22,631</td>
<td>16,406</td>
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<td>2015</td>
<td>8,478</td>
<td>21,263</td>
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<tr>
<td>2016</td>
<td>10,109</td>
<td>34,023</td>
<td>23,914</td>
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</table>

Seedcotton (MT)

<table>
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<tr>
<th>Year</th>
<th>Seedcotton (MT)</th>
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<tbody>
<tr>
<td>2007</td>
<td>65,926</td>
</tr>
<tr>
<td>2008</td>
<td>37,161</td>
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<td>2009</td>
<td>74,384</td>
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<tr>
<td>2010</td>
<td>129,630</td>
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<td>2011</td>
<td>52,723</td>
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<td>2012</td>
<td>40,393</td>
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<td>2013</td>
<td>48,325</td>
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<tr>
<td>2015</td>
<td>66,543</td>
</tr>
<tr>
<td>2016</td>
<td></td>
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</tbody>
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Trade data, Trade map calculations based on UBOS statistics and production data from CDO
1. There are 39 ginneries in Uganda, with an installed ginning capacity of close to one million bales per annum, an equivalent of 185 million MT.

2. Ginneries operate at an average of only 10% of the established capacity—some are inoperable and others silent.

3. During the last four years, it is estimated that 25,000 to 45,000 MT of cottonseed are produced annually.

4. Most of it is processed and consumed locally by the emerging animal feeds & vegetable oil needs (bakeries and confectionaries).

5. The market is still not exhausted.
Milling and oil extraction

Uganda’s edible oil trade balance (US$ 000’)

1. There are about 9 cottonseed crushing and oil extraction facilities, operating at an average capacity utilization rate of 33%.

2. There is high demand for edible oil in Uganda, standing at 120,000 MT against a production capacity of 40,000 MT, leaving a deficit of 80,000 MT annually.

3. The WHO’s recommended per capita consumption of edible oil is 19.21 kg per person per annum, and in Uganda it is about 3.2 kg (16%).

4. Uganda’s high and rising edible oil trade deficits are a strong indicator of unmet demand in the domestic market, representing an opportunity for investment.
Milling and oil extraction cont’

1. Production has never reached the 1969 peak of 26,000 MT, it has increased from 2,000 MT in 1987 to 16,000 MT, with a growth rate of 1.4 per cent in 2010

2. Cotton seed oil has an unpleasant smell compared to other oil seed.

3. It has a dark colour and, if not bleached, would need pre-heating to moderate the colour.

4. Millers undertake refining, bleaching and deodorizing, before it can be sold to the food industry in bulk or as a finished consumer good

5. Limited supply of the raw material (cotton seed)

6. Inadequate capital

7. Competition from other edible oils
Impediments and challenges

1. Excess capacity not utilized
2. Inadequate supply of seed cotton;
3. Inadequate working capital;
4. Load shedding/power shortages for a number of days;
5. Breakdown of machines, which are expensive to repair; and lack of technical capacity among local technicians,
6. Spare parts are not readily available
7. On the side of taxation, - “many taxes” (CDF, CESS and corporate tax
1. With an estimation of only 25,000 – 45,000 MT of cottonseed produced annually, it implies that there is limited internal production of the by-product.

2. Uganda has a population of about 40 million people. The country is increasing its demand for animal feeds because of the increased demand for animal and poultry products (milk, meat, chicken and eggs).

3. It is estimated that if 50 per cent of the total number of livestock in Uganda are fed on formula feeds, the demand would exceed 7,000,000 MT (note that cottonseed cake is just one of the many ingredients).

### Export and imports of animal feeds

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<tbody>
<tr>
<td>Exports</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(US$)</td>
<td>313</td>
<td>222</td>
<td>438</td>
<td>1,019</td>
<td>2,520</td>
<td>5,060</td>
<td>4,325</td>
<td>2,096</td>
<td>3,608</td>
<td>1,716</td>
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<tr>
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<td>228</td>
<td>402</td>
<td>525</td>
<td>513</td>
<td>1,358</td>
<td>1,214</td>
<td>620</td>
<td>812</td>
</tr>
<tr>
<td>(US$)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Exports</td>
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<td>8,963</td>
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<td>MT</td>
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</tr>
</tbody>
</table>
The challenge

1. The annual production of compounded feeds by the commercial feed millers is estimated at about 75,000 MT (old statistics)

2. Small scale mixers producing 40,000 MT

3. There are standards regulations enforcement issues.

4. Sometimes the market fluctuates

5. Nonetheless, the potential is high.

<table>
<thead>
<tr>
<th></th>
<th>Cattle</th>
<th>Poultry</th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indigenous</td>
<td>Exotic</td>
<td>Indigenous</td>
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<tr>
<td>2008</td>
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<td>730</td>
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<td>2012</td>
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<tr>
<td>2013</td>
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<td>2014</td>
<td>12,709</td>
<td>914</td>
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<tr>
<td>2015</td>
<td>13,090</td>
<td>941</td>
<td>40,382</td>
</tr>
<tr>
<td>2016</td>
<td>13,377</td>
<td>991</td>
<td>40,597</td>
</tr>
</tbody>
</table>
• Uses

1. They are mixed with cottonseed meal with the intention to create a higher density product that is easier to transport and handle.

2. Also used as substrate for mushroom cultivation and the spent substrate can be fed to livestock.

3. However, mushroom growing is still done by very few individuals as the trade is not widely known.

Challenges of using cotton husks as a substrate include

1. Low availability of cotton husks because they are demanded as fuel for boilers,

2. Limited knowledge on mushroom growing

3. Spawn is expensive and not readily available
1. Cotton linters are fine, very short fibers that remain on the cottonseed after ginning.

2. There is a range of products produced from linters which include:
   - *Security paper*;
   - *Currency paper*;
   - *Raw material in the manufacture of cellulose plastics, commonly used for medical supplies such as bandages, cotton buds, cotton balls and x-rays*

3. CDO installed few de-linting machines to perform this function but due to technology limitations, the quality produced did not meet the standards for the export market.

4. It is unlikely that there are sufficient volumes of linters to achieve economies of scale given the low levels of lint produced.
Surgical cotton

1. Uganda, annually imports over 124 MT of absorbent cotton and is a net importer of cotton wool and related products.

2. Apart from being used in health care facilities, cotton wool is increasingly being used in cosmetic care as ear cleaners, nail cleaners and face cleaners, as well as for baby care.

3. The two main buyers of absorbent cotton include;
   - National Medical Store (NMS) Joint Medical Store (JMS) and
   - The rest is supplied to clinics, pharmaceutical shops and saloons.

4. The value chain is yet to expand to more sophisticated products like sanitary pads and diapers, among others.

5. The processors interviewed were operating far below their installed capacities (about 34%).

6. Cotton wool production faces stiff competition from imported cotton products which are, in some cases, of superior quality.

7. Storing the raw material poses a challenge (fire, staining, and locking up capital)
Soap stock

1. Soap making in Uganda largely uses other soft oils, rather than cotton soap stock.
2. This is because cotton soap stock needs to be blended with other oils in order to grain instead of yielding a soft consistency,
3. It has an unpleasant smell which is difficult to remove.
4. Overcoming these limitations increases the unit cost of producing soap using cotton soap stock.
5. Instead they opt for the use of cost effective oils, like palm.
6. Currently, there is no effort to invest in improving technologies to benefit from cotton soap stock by soap producers partly because the small quantities of available cotton soap stock do not warrant the investment.
7. Although the biotechnology laboratory at UIRI trains people in soap manufacturing, they largely use other ingredients reasons
Conclusion

1. This report attempts to get a deeper understanding of the development of cotton by-products in Uganda.

2. Farmers are responding to the call to increase cotton cultivation, however, it is way below the thresholds required to meet the current ginning capacity.

3. Although CDO works closely with ginneries to provide extension services and inputs to farmers, there are still gaps in the provision of both

4. There is limited development of the cotton by-products value chain and yet a number of opportunities exist

5. Technology remains a main limiting factor to exploitation of the optimal potential of the by-products

6. There are limitations with local capacities and skills to exploit the by-products

7. Credit is a challenges to both development and recurrent expenditures

8. Spare parts remain a challenge as they are sourced from out of the economy

9. Electricity is susceptible to load shedding – sometimes erratic leading

10. Although CDF was created by the stakeholders to support the sector, some perceive it as a tax
Recommendations

1. Increase *cotton production* through improving and facilitating extension services, provision of quality inputs and affordable credit to farmers.

2. Increase both *public and private investments* in the development of cotton by-products in order to harness its potential.

3. Government should ensure that *cotton prices* are stable and attractive to encourage farmers to grow cotton.

4. Government needs to support the *development of local textile industry* to increase the demand for seed cotton and in turn this will avail sufficient raw material for cotton by-products.

5. Ensure quality and adherence to *standards from production*, transportation to processing.
Recommendations cont’

6. Review government policies on taxation which increases the unit cost of production at both farm level and in the ginneries as well as other processing/manufacturing facilities.

7. Implement policies to incentivize investment in and adoption of technologies to harness the opportunities that exist among the cotton by-products.

8. Ensure that electric power is consistently available and it is affordable

9. Government needs to provide for access to credit work working and development capital

10. Train and build the capacity of the technical workforce in their respective manufacturing and processing plants to effectively manage the equipment and undertake repairs and maintenance work.
THANK YOU