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

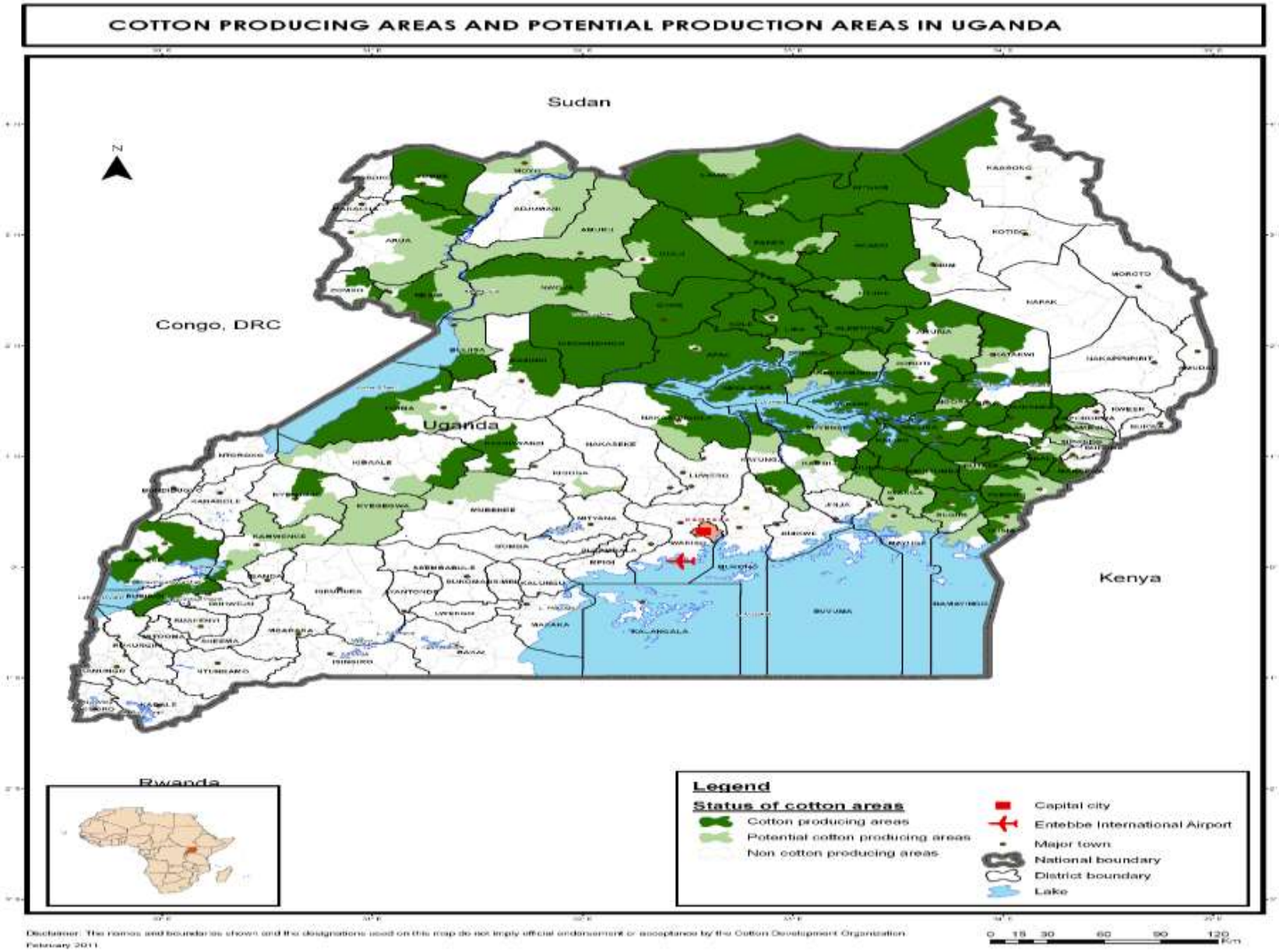
1. The research basically applies two methods to collect and analyze data i.e.

   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

Cotton Growing areas in Uganda

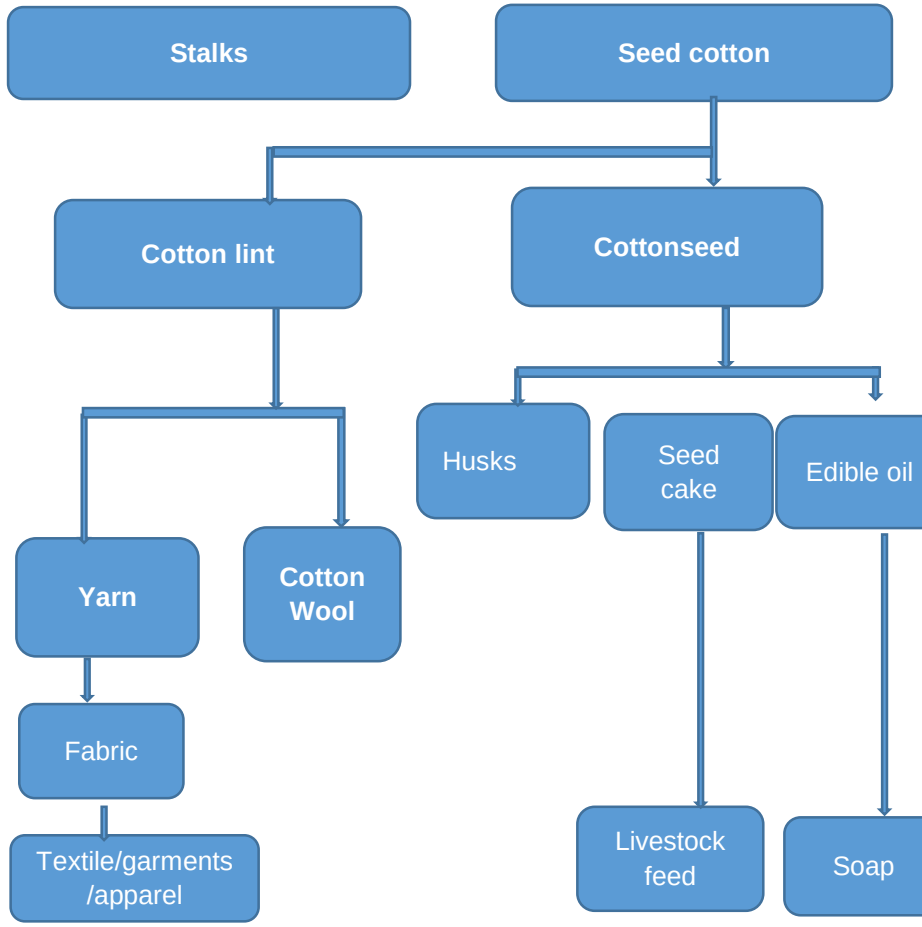
1. Most parts of Uganda have the potential to produce cotton.



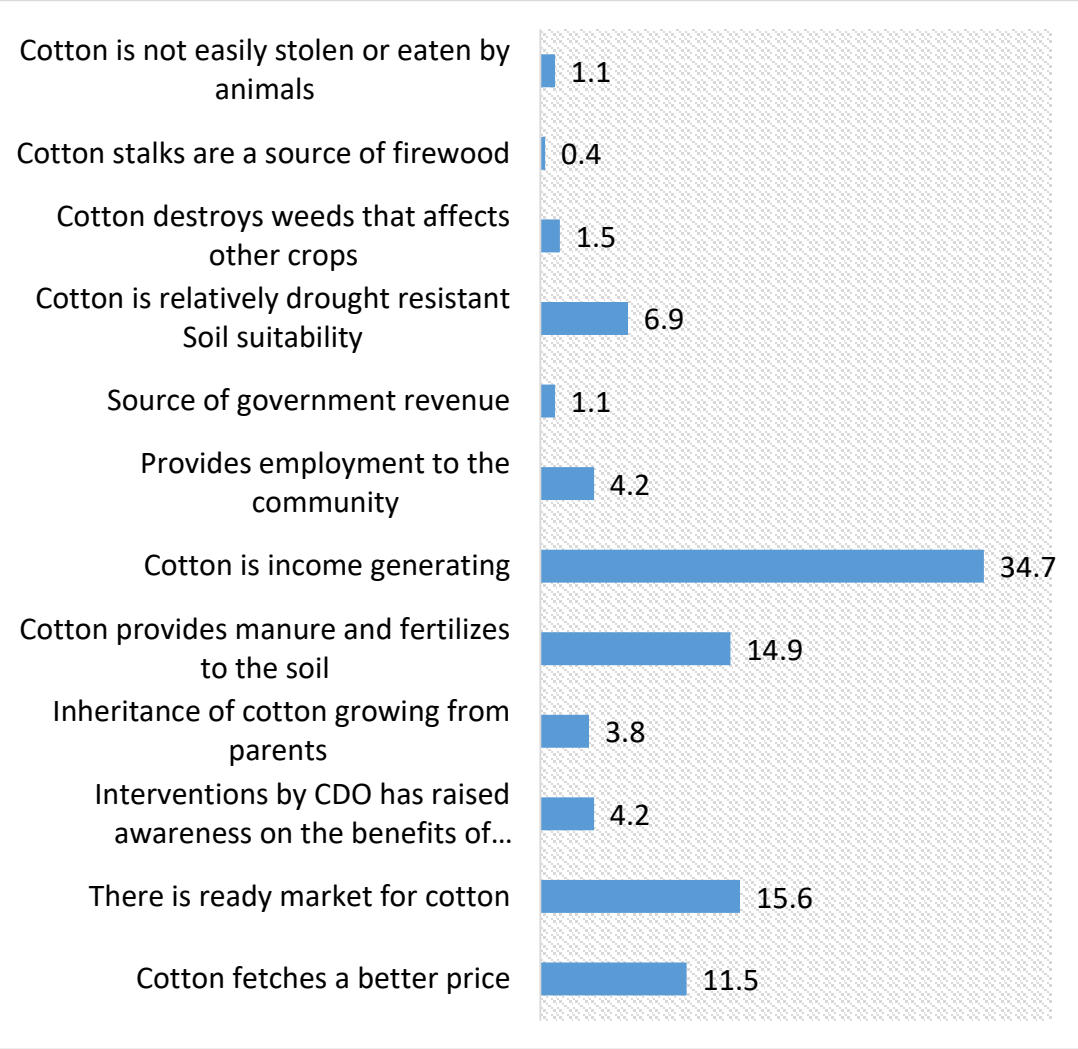
Results

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

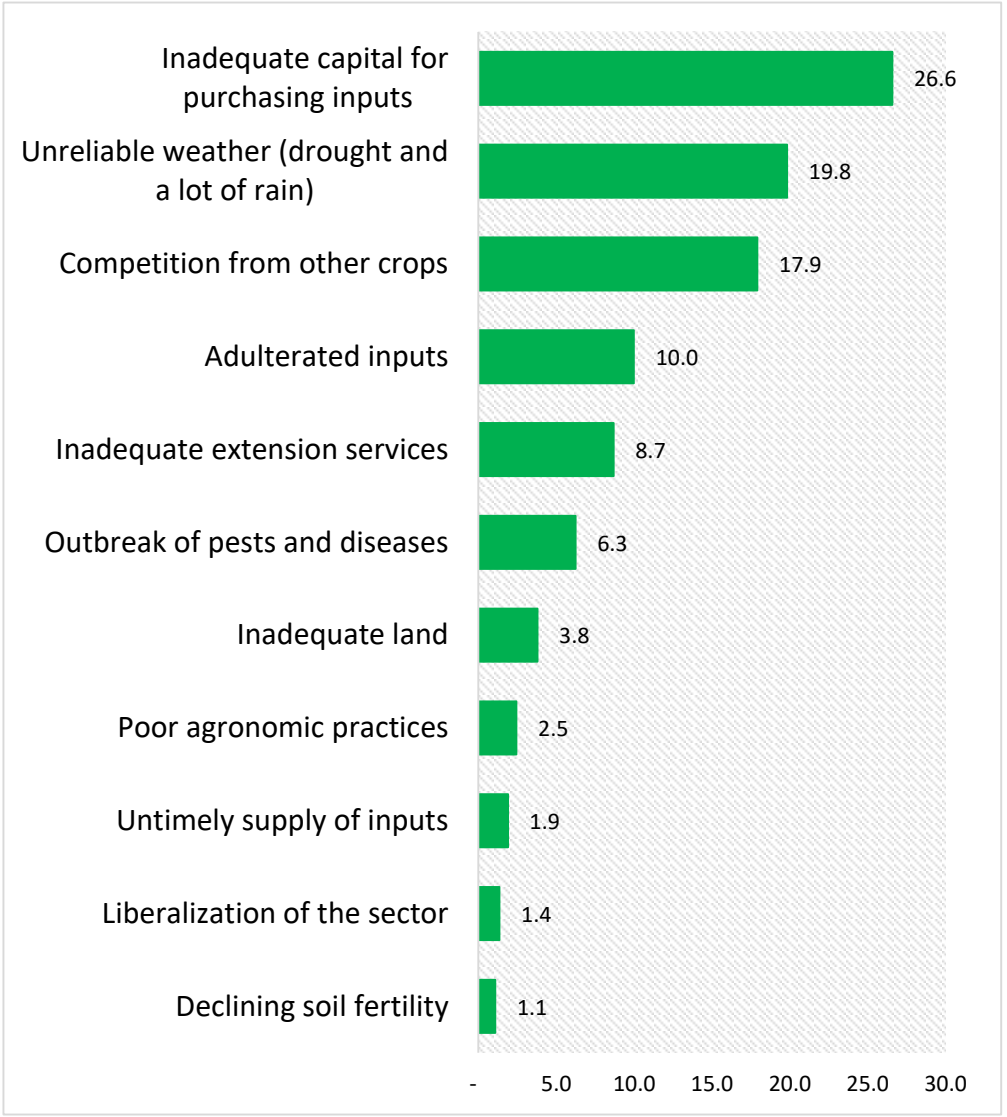
A summarized cotton value chain in Uganda



Factors that influence farmers to grow cotton

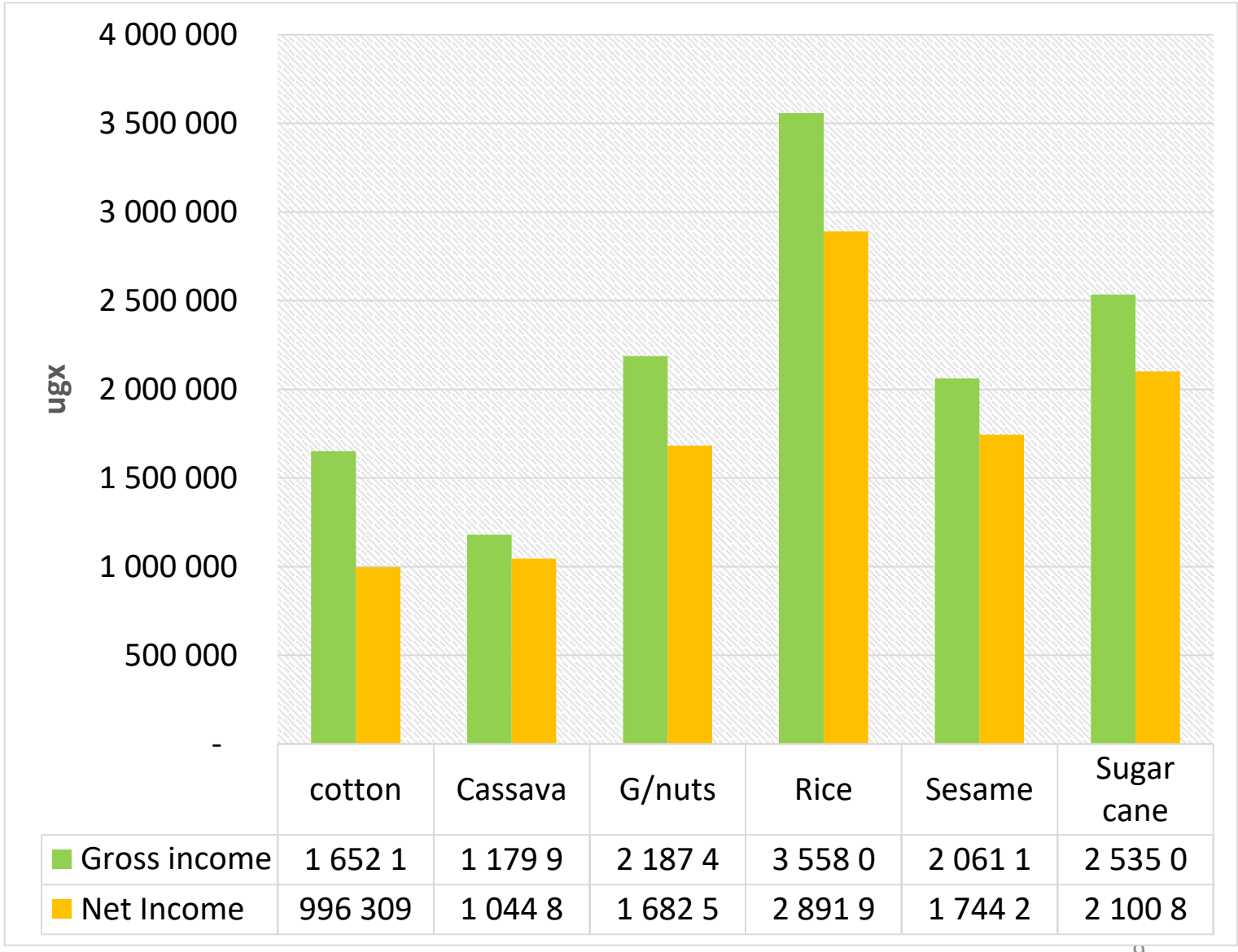


Impediments at farm level



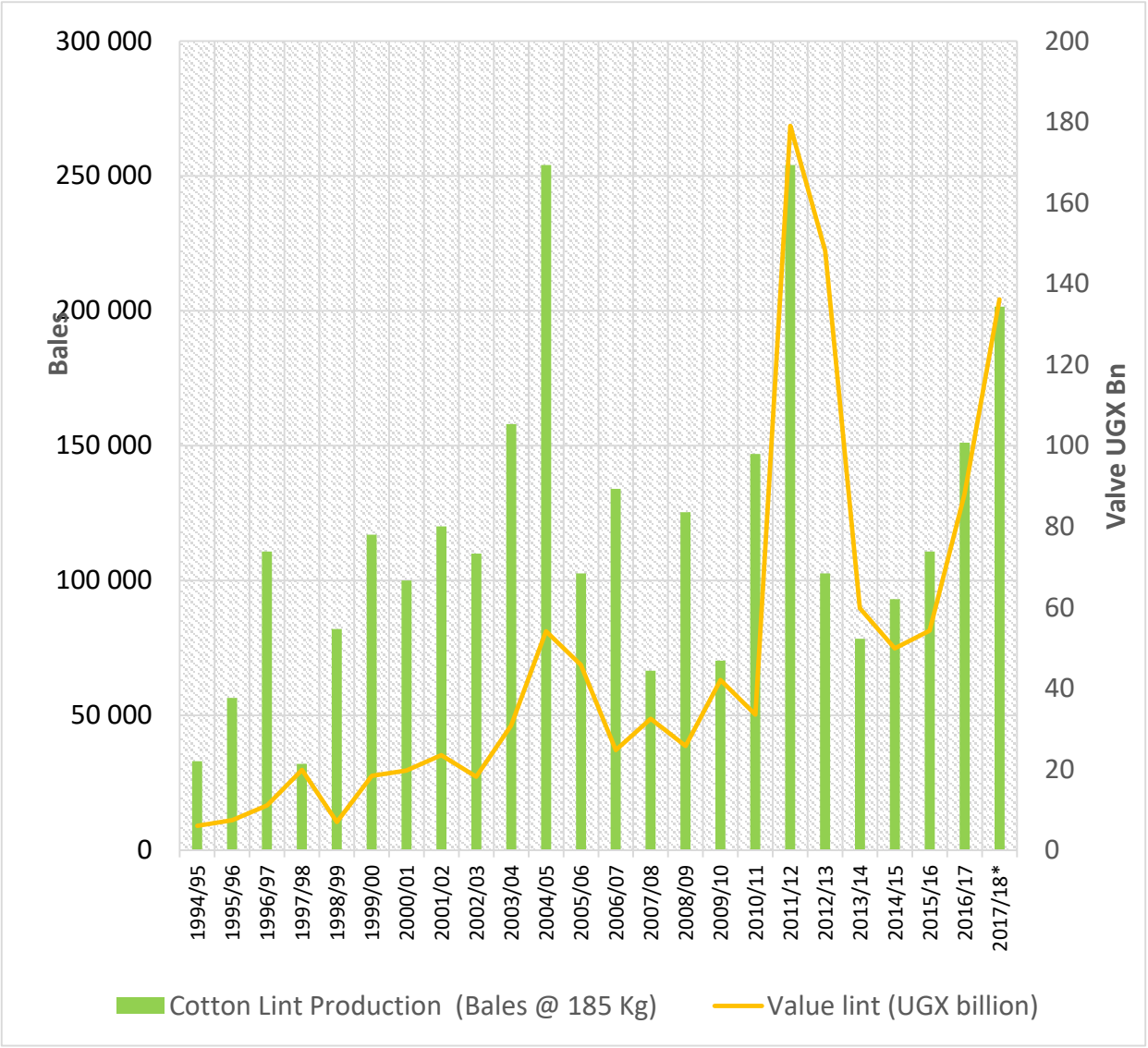
Profitability analysis for cotton and main competing crop enterprises (UGX per acre)

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.

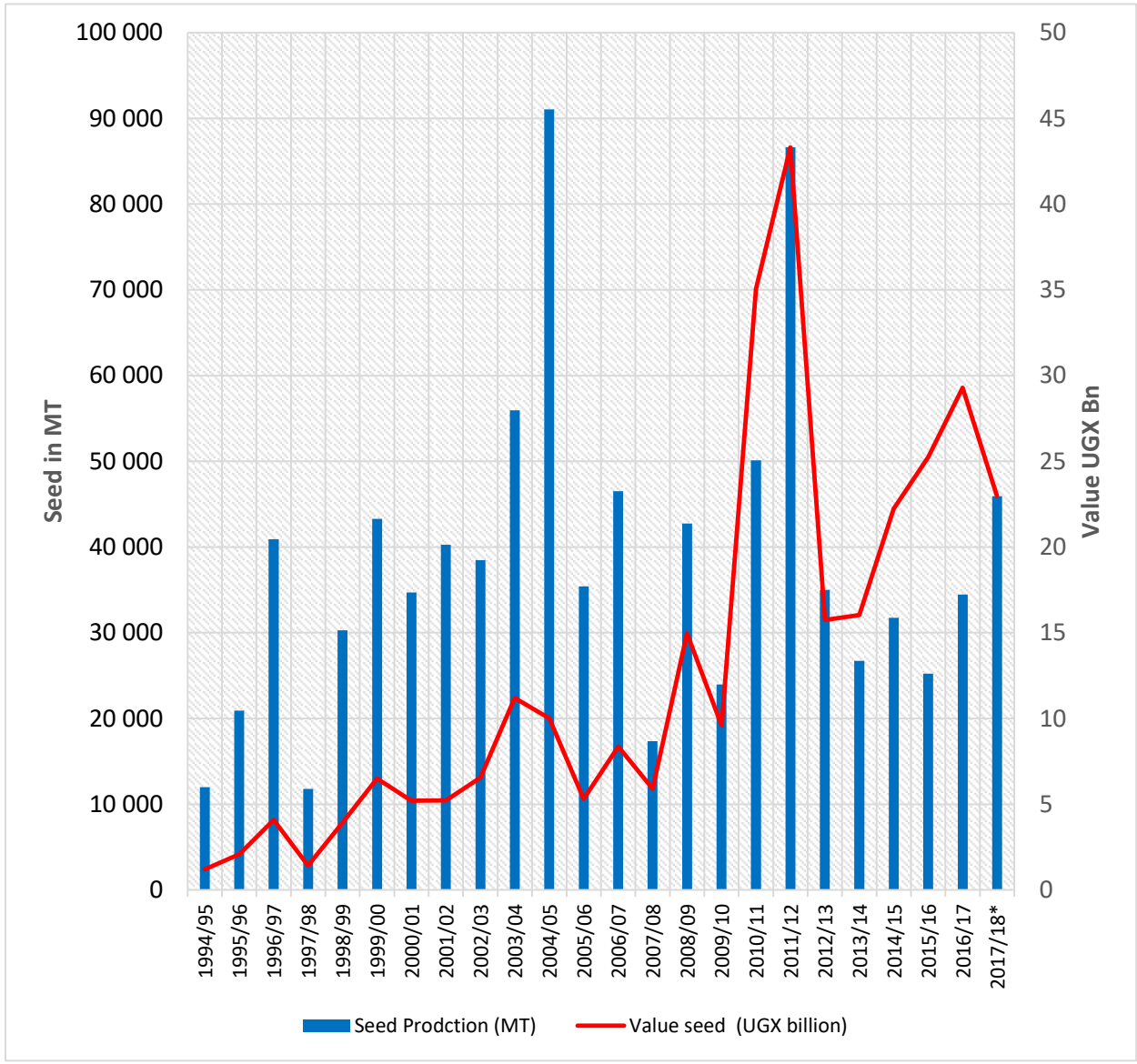


	cotton	Cassava	G/nuts	Rice	Sesame	Sugar cane
Gross income	1 652 1	1 179 9	2 187 4	3 558 0	2 061 1	2 535 0
Net Income	996 309	1 044 8	1 682 5	2 891 9	1 744 2	2 100 8

Trends in lint production and value



Trends in seed production and value



Data source CDO

Cotton stalks

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

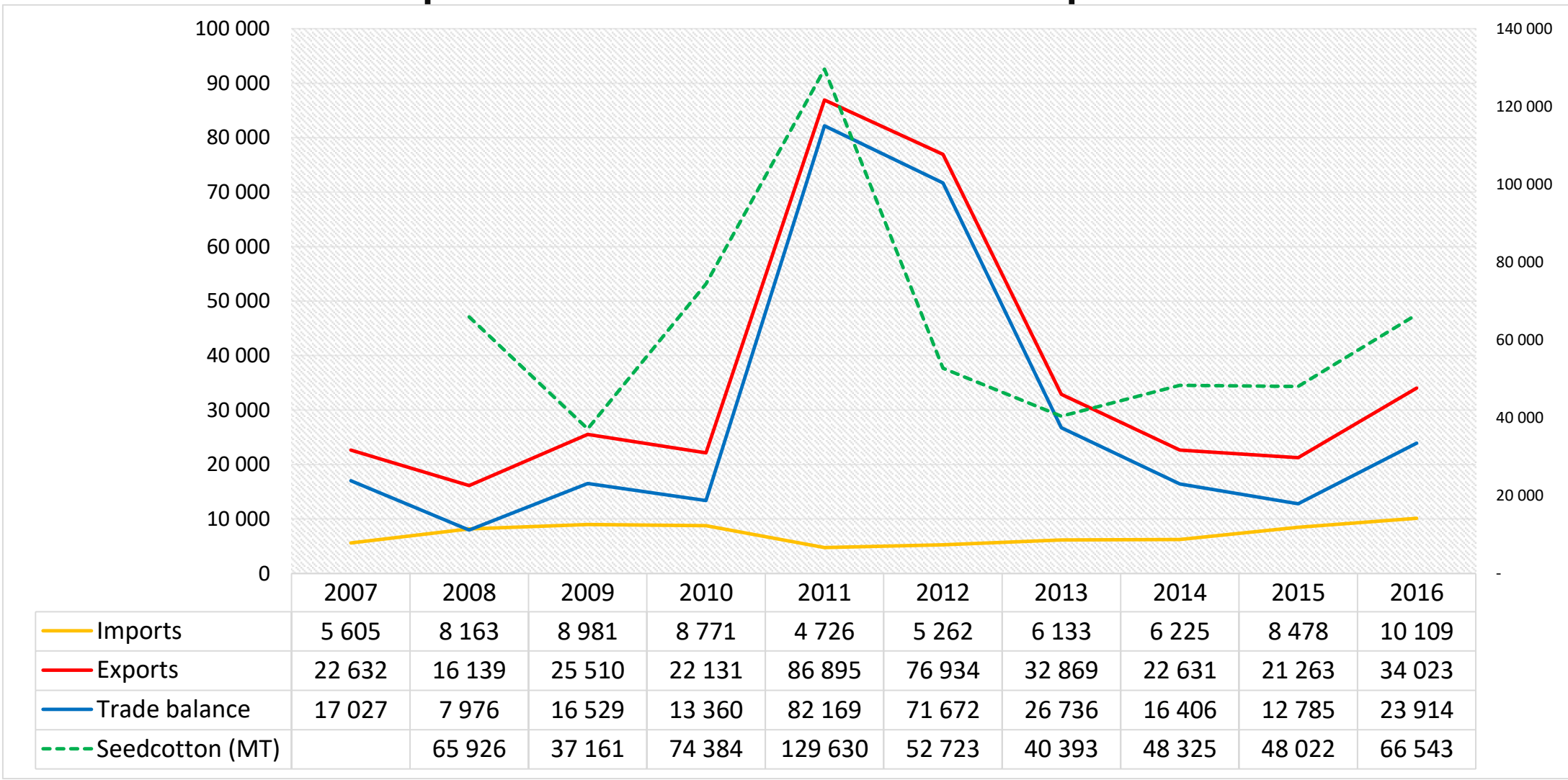
Imports and exports of particle boards

Code 4410	2012	2013	2014	2015
Exports in (MT)	5,274	6,088	4,152	3,778
Imports in (MT)	1,239	598	644	852
Exports (US $ 000)	2,185	2,612	1,738	1,700
Imports (US $ 000)	1,054	310	457	433

Challenges

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

Seed cotton production and cotton products trade



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Imports	5 605	8 163	8 981	8 771	4 726	5 262	6 133	6 225	8 478	10 109
Exports	22 632	16 139	25 510	22 131	86 895	76 934	32 869	22 631	21 263	34 023
Trade balance	17 027	7 976	16 529	13 360	82 169	71 672	26 736	16 406	12 785	23 914
Seedcotton (MT)		65 926	37 161	74 384	129 630	52 723	40 393	48 325	48 022	66 543

- Trade data, Trade map calculations based on UBOS statistics and production data from CDO

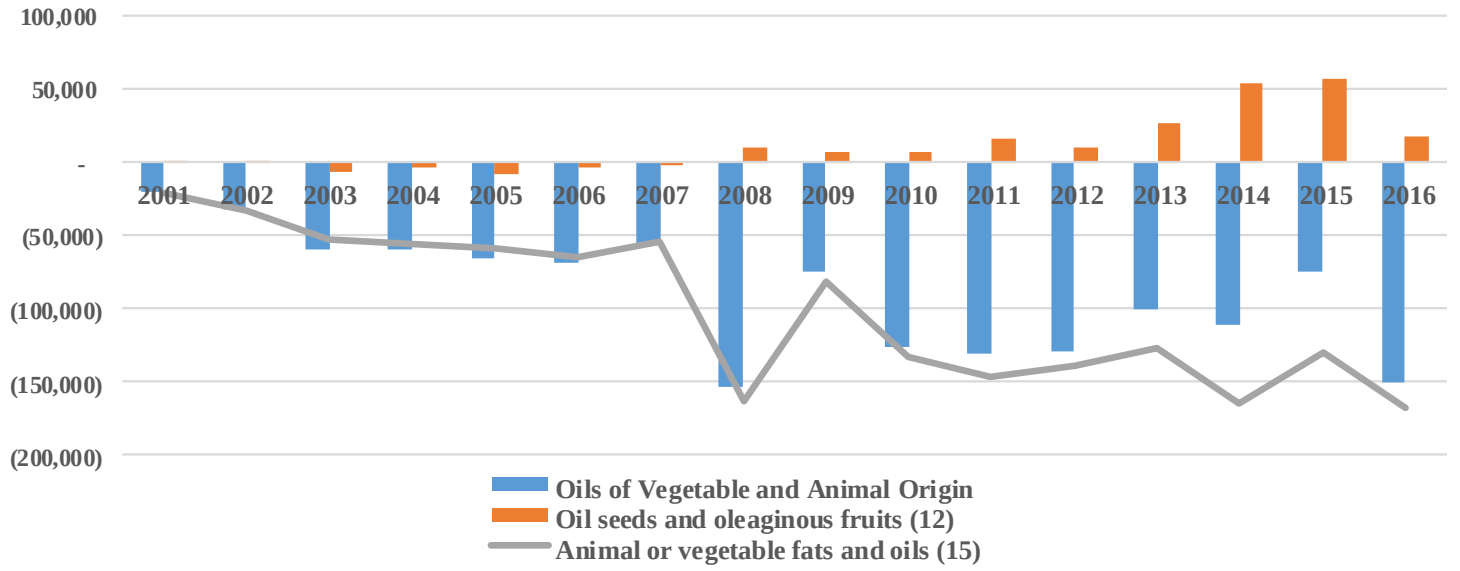
Ginning - cotton seed

1. There 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 4 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')

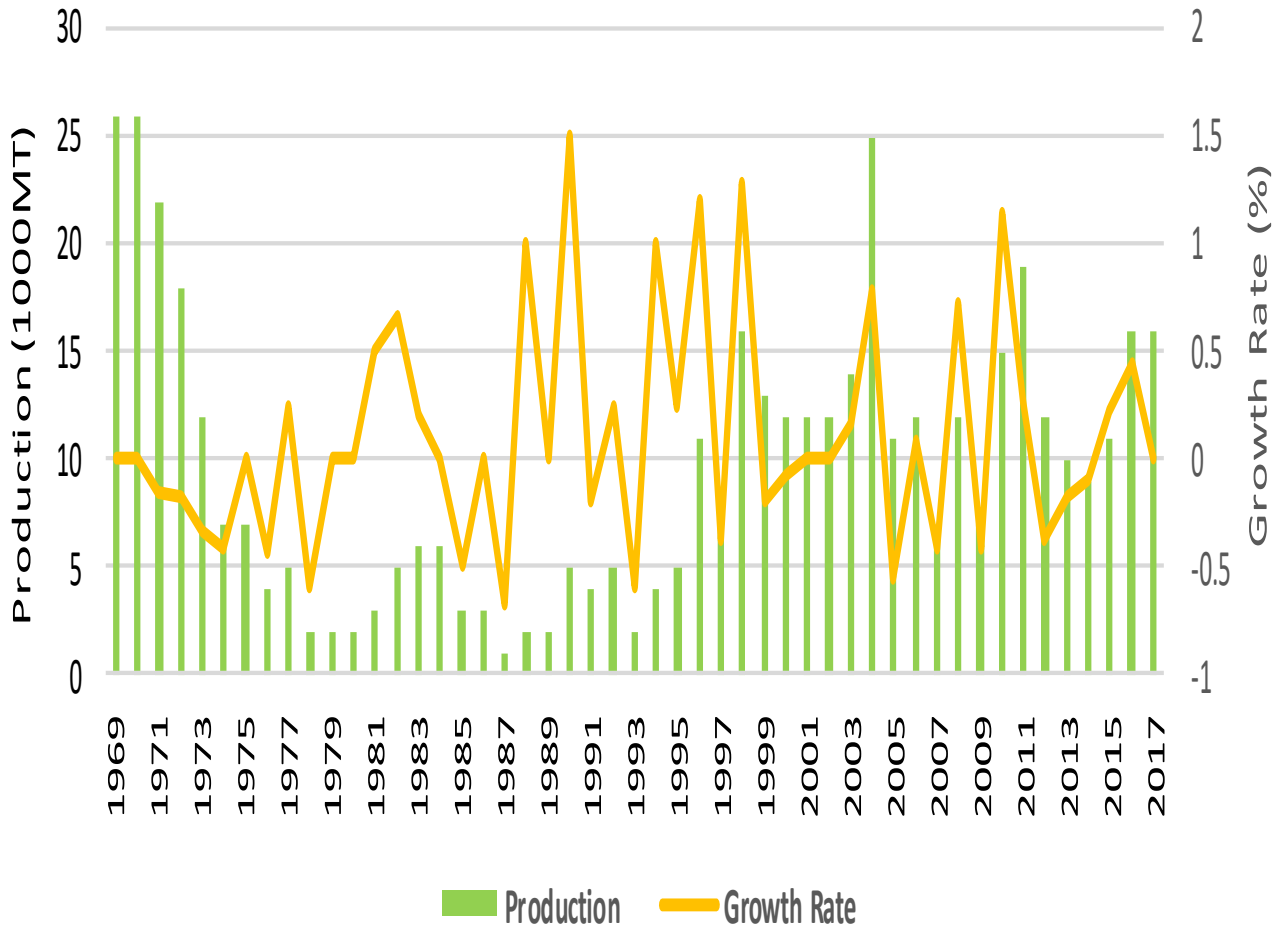
1. There are about 9 cottonseed crushing and oil extraction facilities, operating at an average capacity utilization rate of 33 %
2. There is high demand for edible oil in Uganda, standing at 120,000 MT against a production capacity of 40,000 MT, leaving a deficit of 80,000 MT annually.
3. The WHO's 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

Cottonseed oil production in Uganda



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

Cottonseed cake

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

Export and imports of animal feeds

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Exports (US$)	313	222	438	1,019	2,520	5,060	4,325	2,096	3,608	1,716
Imports (US$)	595	205	228	402	525	513	1,358	1,214	620	812
Exports MT	5,349	2,620	8,805	3,516	5,820	18,900	22,507	6,110	12,025	4,633
Imports MT	4,856	7,094	7,388	12,595	16,874	15,564	19,698	14,880	7,478	8,963

cottonseed cake cont'

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.

Cattle and Poultry Estimates ('000s) by breed 2012 - 2016

	Cattle		Poultry		Goats	
	Indigenous	Exotic	Indigenous	Exotic	Indigenous	Exotic
2008	10,679	730	32,835	1,536	12,288	162
2012	11,979	861	36,955	5,176	13,830	182
2013	12,339	887	38,064	5,332	14,245	188
2014	12,709	914	39,206	5,492	13,829	182
2015	13,090	941	40,382	5,657	15,113	199
2016	13,377	991	40,597	5,694	15,521	204

Hull or husks

- ***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 know

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

Linters

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 challenges (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 an 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