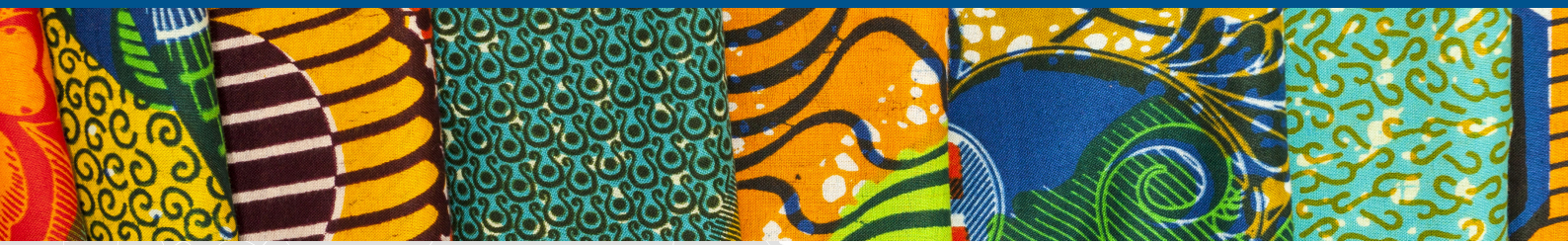
UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD



PROMOTING COTTON BY-PRODUCTS

In Eastern and Southern Africa

Investing in Uganda's cotton by-products

Absorbent cotton wool production

from short- staple cotton and gin-waste

July 2019

Project: 1617K - Funded by the United Nations Development Account - 2016-2019

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD

Investing in Uganda's cotton by-products



Project title: Absorbent cotton wool production from short- staple cotton and gin-waste

Total investment: US$ 390,315

Proposed project location: Mbale district

Contact:
Uganda Investment Authority
Twed Plaza Plot 22B, Lumumba Avenue
P.O. Box 7418 Kampala Uganda, East Africa
Tel: +256 (0) 0414 301 000
Fax: + 256 (0) 414 342 903
Email: info@ugandainvest.go.ug
www.ugandainvest.go.ug

Geneva, July 2019

Acknowledgments

UNCTAD commissioned this investment profile as part of United Nations Development Account Project 1617K: "Promoting cotton by-products in Eastern and Southern Africa (ESA)". The profile is intended as a tool for the Government of Uganda to promote investments in cotton by-products.

For more information, please visit the project site at: www.unctad.org/commodities.

The investment profile was written by a national consultant, Ms. Rebecca Nalumu, Research and Planning Executive, Uganda Free Zones Authority (UFZA).

The work was supervised by Mr. Kris Terauds, Economic Affairs Officer, under the direction of Ms. Yanchun Zhang, Chief, UNCTAD's Commodities Branch.

While due care was taken in compiling and reviewing this report, any errors and omissions remain the author's responsibility.

Contacts

For further information on the Commodities Branch, please contact us at:

UNCTAD
Commodities Branch
Palais des Nations
8–14, Avenue de la Paix
1211 Geneva 10
Switzerland
Phone: +41 22 917 1648 / 6286
E-mail: commodities@unctad.org

UNCTAD/DITC/COM/INF/2019/7

Table of Content

List of Figures

List of Tables

List of Acronyms and Abbreviations

BoU ..... Bank of Uganda

BPA ..... Bukalasa Pedigree Albar

CDO ..... Cotton Development Organisation

COMESA ..... Common Market for Eastern and Southern Africa

EAC ..... East African Community

GMP..... Good Manufacturing Practices

Ha ..... Hectare

KVA ..... Kilo-Volt-Ampere

MBPs ..... Megabits per second

MT ..... Metric Tonne

MFPED ..... Ministry of Finance, Planning and Economic Development

NGOs ..... Non-Government Organisations

NARO ..... National Agricultural Research Organisation

NASARRI ..... National Semi- Arid Resources Research Institute

NDA ..... National Drug Authority

NSSF..... National Social Security Fund

SAAPRI ..... Serere Agricultural and Animal Production Research Institute

SADC ..... Southern Africa Development Community

SATU ..... Serere Albar Type Uganda

UBOS ..... Uganda Bureau of Statistics

UIA..... Uganda Investment Authority

UNBS ..... Uganda National Bureau of Standards

URA..... Uganda Revenue Authority

US$ ..... United States of America Dollars

US$A ..... United States Department of Agriculture

URSB ..... Uganda Registration Services Bureau

VAT ..... Value-Added Tax

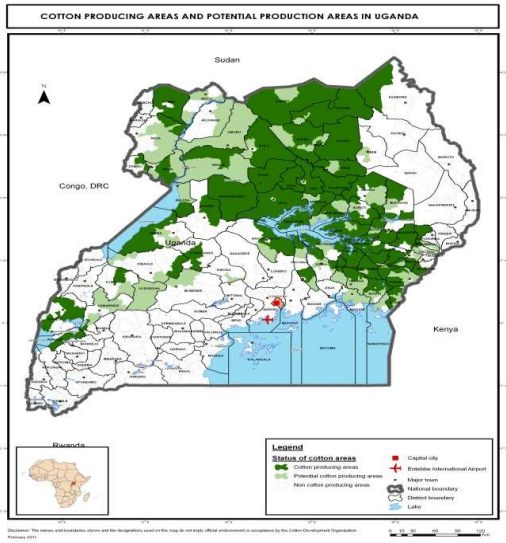
1. The cotton subsector in Uganda

1.1 Background

Uganda's history in cotton production dates back in the early 1900s. To date, the crop remains one of the most significant cash crops, supporting an estimated 2.5 million livelihoods. The growing demand for cotton worldwide has propelled exponential growth in the subsector. According to the United States Department of Agriculture (US$A), Uganda is one of the major exporters of cotton in Africa and the world, ranking 11th and 27th respectively, in 2018. In the same year, the subsector generated export earnings of 44.34 million United States of America dollars (US$), compared with US$ 50.70 million in 2017, and US$ 31.43 million in 2016 according to the Bank of Uganda.[1] Cotton was ranked as the country's 6th largest export crop in 2018, according to Bank of Uganda (BoU). In the same year, Uganda was the 15th African cotton producer, according to US$A. The country has the highest cotton yields in the East African Community region and ranks 10th in Africa.[2] Uganda's cotton attracts premium prices on the international market and is rated among the preferred choices for several local and international buyers.[3] Cotton can be produced in most parts of Uganda (Ahmed and Ojangole, 2012). One hundred per cent of the crop grown today is of the Bukalasa Pedigree Albar (BPA) variety. The Serere Albar Type Uganda (SATU) variety is also mentioned occasionally, but was mainly grown in northern and eastern dry areas of Uganda until 1994. The SATU variety of cotton yields short, coarse lint fibres, suitable for processing into absorbent cotton wool. Although the SATU variety has not been grown in Uganda for several years, the germplasm is maintained at the National Agricultural Research Organisation (NARO) and can be multiplied.

1.2 Cotton growing areas

Figure 1: Cotton growing areas



Uganda's favourable climatic conditions and nature of soils favour the growing of cotton in several parts of the country. Cotton is grown across approximately two-thirds of Uganda's land area *(Lugojja, 2017).* The main growing areas include Eastern, Northern, Lower West Nile and South Western regions in the Kasese area. The soil conditions are sandy and loamy, contributing to high cotton productivity. Cotton planting in the Northern region starts from April to June and receives one rainy season, while cultivation in the South region receives two rainy seasons, with planting occurring between June and July. The crop is handpicked, maintaining its high quality since there is less trash content, contamination and minimum interference with the fibre characteristics,

[1] Bank of Uganda (BoU) https://www.bou.or.ug/bou/rates_statistics/statistics.html
[2] United States Department of Agriculture
[3] Uganda Investment Authority (UIA), Cotton Sector Profile, available at http://www.ugandainvest.go.ug/uia/images/Download_Center/SECTOR_PROFILE/Cotton_Sector_Profile.pdf

compared with machine harvested crops according to the South African wool and textile research institute of the CSLR[4]

1.3 Key products

The cotton plant is a raw material supporting many industries. Uganda produces lint, cotton seed, and cotton stalks. Although lint is the main product from the cotton plant, other parts of the plant such as the cottonseed have also been processed into several by-products in the cotton subsector *(Shinyekwa et al, 2018).* The ginners produce cottonseed, which is processed by millers into linters, hulls, cottonseed oil and cake. The seed oil and cake are further processed into cooking oil and animal feeds, respectively. The lint is processed into yarn, used by textile mills involved in spinning, weaving, knitting and garments *(Lugojja, 2017).* Some private manufacturers are processing cotton lint and making absorbent cotton wool for the domestic market, but many of the manufacturers are operating below capacity. The major problem stems from the low-grade imported cotton wool, which costs less than locally manufactured cotton wool. In addition, Uganda no longer produces the short-staple[5] cotton variety; considered better suited for producing absorbent cotton wool. Most manufacturers use the BPA variety, which has a fine longer fibre more suitable for the production of yarn. Domestic competition for cotton lint, between the textile and absorbent cotton wool industries, in addition to ginners exporting the majority of their lint, severely constrains the availability of raw material. As a result, most absorbent cotton wool is imported. In 2017, the net imports of absorbent cotton wool stood at 178 metric tonnes (MT). By 2018, demand had increased to 267 MT. Demand is expected to increase due to the growing population, number of hospitals, health centres and pharmacies across the country.

1.4 Cotton production

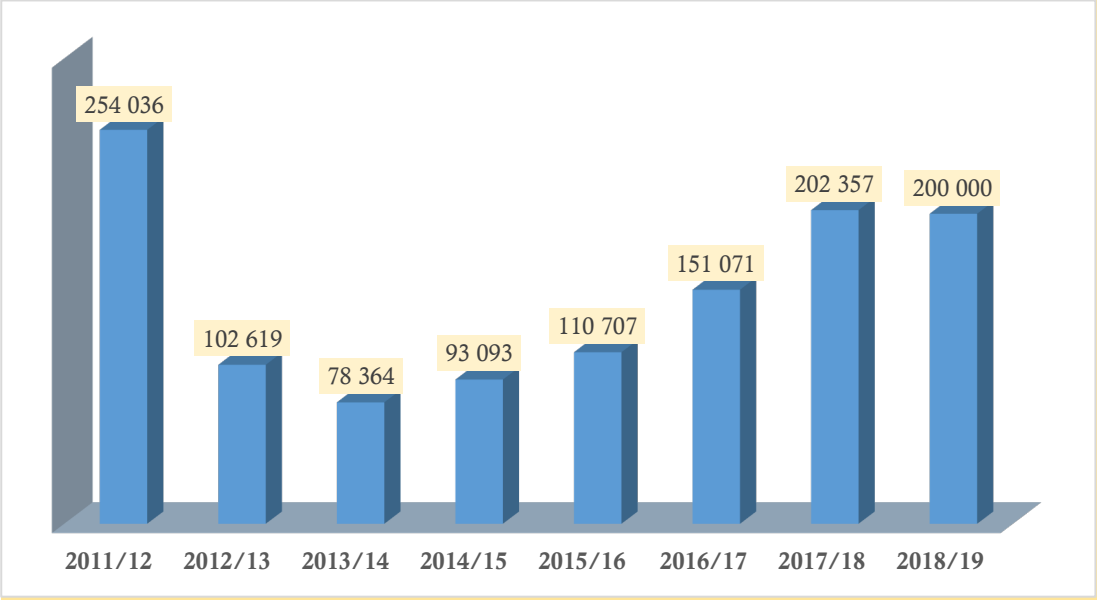
Uganda is among the top world producers of cotton. The subsector has witnessed a general increase in production over the last 10 years, but current production is well below the peak of 256,036 bales in the 2011/12 season. In 2015/16, annual production of lint stood at about 110,707 bales and increased to a total of 151,071 bales of lint in 2016/17.[6] By 2017/18, production had reached 202,357 bales and is projected to be 200,000 bales in 2018/19 (figure 1.2). According to the Cotton Development Organisation (CDO), the total area under cultivation was estimated at 109,312 hectares (ha) by 2017. The increase is attributed to the deliberate government initiatives to boost productivity by supplying pesticides, herbicides, fertilizers, and seed to farmers.

[4] https://researchspace.csir.co.za/dspace/bitstream/handle/10204/4719/Hunter%20L_1.pdf?sequence=1&isAllowed=y

[5] "Staple" refers to a fibre's length. In general, spinners prefer long staple cotton (3cm+) as it yields finer yarns. Short-staple cotton (<2.5cm) is less valued. Ginneries can recover short-staple cotton after they clean their seed cotton prior to ginning, and then their lint prior to baling. In small volumes, it is often uneconomical for ginners to recover short-staple cotton so it is often disposed of as gin waste. Spinners can also recover short-staple cotton after combing, which is known as "comber noil".

[6] Ministry of Finance Planning and Economic Development (MFPED), Background to the Budget Fiscal Year 2018/19

Figure 1.2: Annual cotton production (bales @ 185kg) 2011/12-2018/19



***Source**: Cotton Development Organisation, Uganda*

Uganda's cotton subsector has evolved over the years since liberalisation in 1994. A rebound in performance has yielded positive results reflected by the increasing lint production and earnings by farmers since 2014/15 (table 1.1). The lint sales are projected to reach US$ 61.05 million in 2018/19 from US$ 22.04 million registered in 2014/15. Similarly, earnings by farmers are expected to reach UGX 190.8 billion in 2018/19 from 56.74 billion in 2014/15.

Table 1.1: Lint sales and earnings by farmers 2011/12-2018/19

Period/Season in FYs	Earnings from lint sales (US$ million)	Earnings by farmers (UGX billion)
2011/12	47.94	148.1
2012/13	30.19	59.83
2013/14	25.08	49.84
2014/15	22.04	56.74
2015/16	25.81	88.01
2016/17	41.64	136.11
2017/18	53.53	187.69
2018/19	61.05	190.8

***Source**: Cotton Development Organisation, Uganda*

1.5 Key strengths and competitive factors

The positive signals in the subsector have sparked investor interest in addition to the growing prospects for value-added products. Absorbent cotton wool production using the SATU variety as a raw material, is an emerging opportunity for harnessing. Key strengths and competitive factors that make absorbent cotton wool production a unique area for investment in Uganda include the following:

a) The industrial raw material (short-staple cotton) will be sourced from farmers, saving on importation and transit costs for the raw material.

b) CDO has started multiplying the SATU variety. This will ensure steady supply of the raw material for absorbent cotton wool production.

c) The technology and skillset required for producing absorbent cotton wool is available using some of the existing cotton wool manufacturing technologies.

d) The cotton industry value chain is fairly developed. Today, Uganda has about 250,000 households engaged in cotton production, 39 ginneries, 2 textile mills, 6 absorbent cotton wool manufacturing firms, oil millers and 9 cotton seed processors. Synergies with other associated industries can be used to benefit the new companies in absorbent cotton wool production.

e) The labour costs in Uganda are competitive. Starting pay for unskilled and semi-skilled surgical cotton workers ranges from US$ 35-135 per month (8-hour shifts, six days per week), depending on the location. For factories located in the countryside the rates are even lower.

f) CDO provides quality control and certification. The country has official cotton standards, recognised internationally. The Organisation operates a modern classifying/grading laboratory, which has improved the quality of lint and provides better prices for Uganda's cotton. The grading standards are set every two years, in accordance with international standards.

g) The installed capacity of existing absorbent cotton manufacturers is 2,080 MT/year. The capacity utilisation for most companies is only 34 per cent. There is opportunity for increasing production using more advanced technologies in the industries *(Lugojja, 2017)*.

h) Uganda's young, abundant, and affordable workforce is one of the biggest attractions for potential investors. The Ugandan population is reasonably well trained, with a fair number of graduates. Uganda has more than 40 universities, which produce over 20,000 university graduates annually in various fields. Uganda is very highly rated for recruitment potential (availability of people seeking employment), workforce trainability (skills application and on-the-job learning) and labour participation, including engagement of women and young people in the labour market. According to World Economic Forum - Human Capital Index global ranking global Workforce Deployment (2017). Uganda ranks 3rd out of 130 countries.

i) Uganda industrial power rates are regularly reviewed downwards, to attract investment. Uganda's electricity costs are competitive at 80% of Kenya's costs (Source: fDi Benchmark from the Financial Times Limited). For medium to large industrial consumers, per kilowatt-hour (kWh) rates range between US$ 0.166 and 0.10. The completion of the Isimba and Karuma Hydro Power Plants will guarantee a steady power supply and reduce power tariffs to about US$ 0.0284 per kWh *(MFPED, 2018)*.

j) Since international lint prices have been low in recent years, there is incentive to add more value to the lint domestically.

k) Uganda has a ready market for absorbent cotton wool. Statistics provided by the Uganda Bureau of Statistics indicate an increasing import bill and market for absorbent cotton wool in Uganda.

l) The installed capacity of existing absorbent cotton manufacturers is 2,080 MT/year. The capacity utilisation for most companies is only 34 per cent. There is opportunity for increasing production using more advanced technologies in the industries *(Lugojja, 2017)*.

m) Uganda's membership to international cotton associations such as the International Cotton Association Liverpool (UK), Bremen Cotton Exchange, Bremen, Germany, International Cotton Advisory Committee Washington, and United States Department of Agriculture has contributed to increasing conformity to standards testing, classification and marketability of cotton in international markets.

n) The international lint prices have been low in recent years, this justifies the need to add value to the lint domestically.

1.6 Policies and programmes to promote value addition

Uganda attaches great importance to improvement of the cotton subsector. Cotton is one of the twelve (12) priority commodities in the National Development Plan (NDP) II 2015/16 -2019/20 and the cotton processing sub sector is among the 26 priority sectors listed for incentives benefit in the Investment Code 2019 . The cotton subsector plays a vital role in promoting sustainable development by creating employment, generating export revenues and supporting industrialization as a raw material. Current national priorities include:

a) Implementation of the lint buffer stock fund to supply lint to textile manufacturers. The fund procured a total of 3,000 bales in 2016/17 and 11,500 bales in 2017/18 which were supplied to Southern Range Nyanza Ltd and Fine Spinners (U) Ltd.

   i. Investment in agricultural research and technologies for value addition, and cotton research for improved varieties. For example, in the 1990s, continued efforts for genetic recombination and selection in the SATU variety led to increases in staple length of more than 40/32nd of an inch, originally only achieved with the BPA variety, while retaining the SATU fibre's coarseness;

   ii. Provision of field extension services to increase the yields per hectare through the Uganda Ginners and Cotton Exporters Association to train farmers in good agronomic practices, such as crop establishment, pest and general crop management, and soil and water conservation in various cotton growing areas;

   iii. Textile industries are benefiting from the provision of electricity at US$ 0.05/kWh. This initiative can be extended to other manufacturers in the subsector; and

   iv. Supply of inputs such as fertilizers, pesticides, herbicides and seeds to farmers to boost production and improve the cotton seed quality.

1.7 Investment opportunities

The cotton subsector provides several opportunities that can be tapped at all levels of the value chain. Uganda is promoting value addition in all sectors of the economy as a strategy to create jobs and increase exports earnings from agriculture. The following opportunities are available for the business community:

a) Establishing large private commercial farms and contracting farmers for production, to boost the domestic supply of short-staple cotton as a raw material for the production of absorbent cotton wool.

   i. Production of charcoal briquettes from cotton stalks.

   ii. Commercial mushroom production using cotton biomass.

iii. Investment in de-gossypol technology - a microbial process that removes gossypol from cottonseed cake to allow it to be used in the more lucrative non-ruminant feed market.

iv. Setting up a medium-sized cotton yarn spinning mills, fabric production plants or fully integrated textile mills.

v. Marketing and exporting of organic cotton.

vi. Investment in pesticide formulators and mixers to control diseases and pests.

vii. Establishment of training/designing schools to build capacity in clothing and apparel industries, and other value-added cotton products.

2. Absorbent cotton wool as an investment project

The project seeks to manufacture absorbent cotton wool using the short-staple cotton and gin waste as the raw materials. The demand for absorbent cotton in Uganda is on the rise driven by, the growing population, increasing number of private hospitals, health centres, pharmacies, and drug shops among others. The current demand outstrips local production. In 2018, the import demand for absorbent cotton wool grew by 50 per cent to 266,753 kg from 177,537 kg in 2017.

2.1 Current production

Uganda has six (6) absorbent cotton wool manufacturing companies. These include; Anik Industries Ltd, Mutuma Commercial Agencies, VIVA Holdings ltd, Nile Surgicot Ltd, South base Agro Industries and Gulf Cotton Ltd. Anik Industries in the second largest firm. The company was acquired by Medicotts Industries at the end of 2019. Viva Holdings is under acquisition by another company. The total installed capacity of the firms in 2016 according to CDO was 2,040 MT whereas the capacity utilisation was about 34 per cent translating into 693 MT per annum. Interviews with selected firms revealed increased volumes of production. Viva holdings produces about 3.6MT of absorbent cotton wool per month, Mutuma produces about 48MT per month while Medicotts industries produces 44MT of absorbent cotton wool per month.

Table 2.1: Production capacity of existing surgical cotton wool manufacturers in Uganda

	Name of company	Location	Year of establishment	Installed capacity MT/year	Capacity utilisation
1	Anik Industries Ltd	Wakiso	1995	880	30%
2	Mutuma Commercial Agencies	Luuka	1999	475	34%
3	VIVA Holdings ltd	Mukono	2012	233	12%
4	Nile Surgicot Ltd	Jinja	2008	200	75%
5	South base Agro Industries	Oyam	1996	150	33%
6	Gulf Cotton Ltd	Kampala	2008	72	29%
			Total	2,080	34%

Source: CDO survey on cotton value addition in Uganda, 2016

2.2 Production process

The production process of absorbent cotton wool goes through a sequence of stages to make it hydrophilic and free from external impurities for use in medical dressings and personal hygiene. In Uganda, absorbent cotton wool is mainly manufactured for medical purposes, but can also be processed into other value-added products which are also marketable. The products include sanitary pads, baby diapers, cotton sliver, cotton dental rolls, boric cotton rolls, cigarette filters, cotton gauze, cotton balls, cotton ear buds, and facial pads. At the moment such products are imported from China, Pakistan, Kenya and South Africa.

The typical production process for absorbent cotton wool takes the following form:

Stage 1: Opening and cleaning lint

i. The cotton lint in pressed bale form is opened in a vertical opener machine and fed into the porcupine cleaner or horizontal cleaner machine to remove foreign substances such as husks, leaves and seeds. The cleaner machine ensures that the cotton is loosened and dusted at the same time.

ii. Loosened cotton is placed into a pressure kier boiler where chemicals such as caustic soda and other detergents are added together with water and steam and boiled for about 6 hours.

iii. The process is carried out to eliminate natural waxes and oils, and to soften and disband the remaining foreign impurities.

iv. The treated cotton lint is conveyed to washing tanks to clean it completely.

Stage 2: Bleaching

- The stage is intended to remove brownish colour resulting from chemical treatment of the raw cotton.
- Bleaching agents such as Hydrogen peroxide are added to the cotton making it whiter and hydrophilic.

Stage 3: Removal of Chemicals and Excess Water

- Bleached cotton is washed again to remove any remaining chemicals. After washing, the cotton is neutralised using regulated amounts of diluted hydrochloric acid or sulphuric acid to reduce excess alkali properties.
- The cotton is transferred into a centrifugal hydro-extractor machine to remove excess water.
- Thereafter, cotton is conveyed to a wet or humid cotton opening machine which separates the fibre.

Stage 4: Drying

- The cotton goes through a continuous drying process using the conveyor dryer machine. In Uganda most absorbent cotton manufacturers sun dry their cotton wool to save on power costs.

Stage 5: Lapping

- The dried cotton is transferred to a blow room where it is opened and set into laps using a lap former.

Stage 6: Carding

- The laps are fed into a carding machine in which cotton is warped around rollers in thin layers.

Stage 7: Rolling

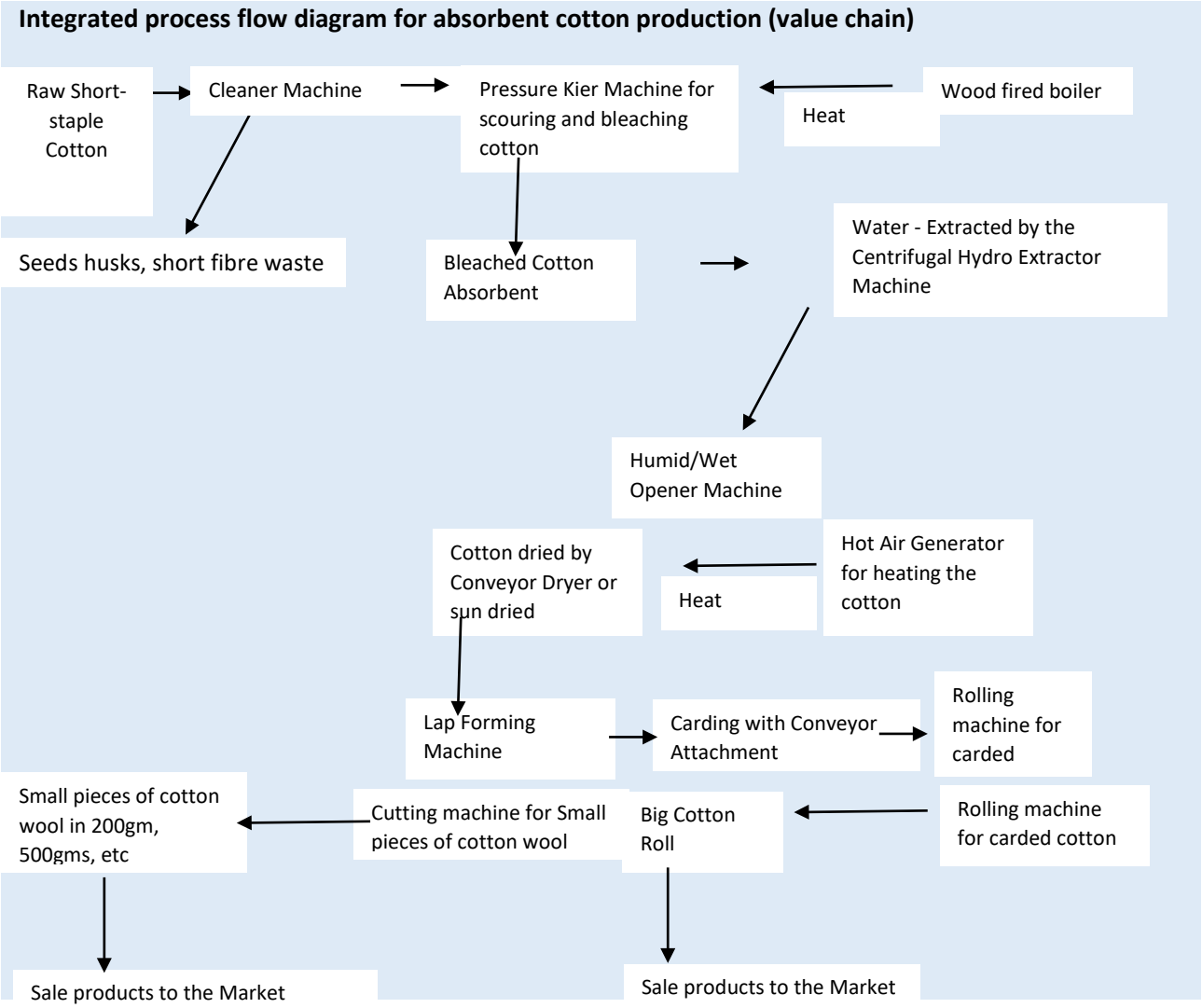
- Cotton is compacted and rolled using a roller machine into suitable roll size together with packaging paper.

Stage 8: Weighing and Cutting

- Using a weighing scale the rolls are weighed and cut with a cutter machine into the required weight and size and labelled before packing in polythene sheets and heated sealed. In Uganda the cotton is mainly weighed and packed in 500g, 200g and 20g weights, depending on the target market.

Source: MSME – Development Institute Ministry of Micro, Small and Medium Enterprises, Government of India, Author's interviews with absorbent cotton wool manufacturers in Uganda

Figure 2.1: Value Cain Process Chart



Source: *Author's interviews with absorbent cotton wool manufacturers in Uganda*

2.3 Purpose and rationale of the project

The purpose of the project is to produce absorbent cotton wool for medical purposes. The cotton wool will be produced for the domestic market and also exported to the regional market. Cotton lint, gin waste and spinning waste will be used as the raw materials. According to CDO, the conversion ratio of lint to cotton wool is 100:86 while the lint outturn ranges between 40 per cent and 44 per cent.

2.4 Projected production capacities, sales and preferred technology

2.4.1 Production capacities

The proposed investment project has a production capacity of 260 MT per annum of absorbent cotton wool. Production will start at 60 per cent capacity in the second year of operation but is expected to rise to 75 per cent in year 3 and grow to 80 per cent and 90 per cent respectively in year 4 and 5, parallel to the multiplication and production of short-staple cotton in Uganda. Export is projected to commence after year 5 of operation.

2.4.2 Preferred technology options for absorbent cotton wool production

This profile proposes a facility with a capacity of 260 MT per annum, consuming 1,728 – 2,880 bales of lint for this output and operating with a single daily shift. The machinery and equipment can be purchased from India or China. Suppliers in both countries can be identified through industry associations, export promotion agencies and even online. The majority of the existing absorbent cotton plant and machinery in Uganda was imported from India. A smaller portion of plant, machinery and spare parts were imported from China.

3. Location logistics and environment aspects

3.1 Proposed location

The proposed location for the factory is Mbale district. The district is situated in Eastern Uganda and is about 225 kilometers (km) from Kampala capital city and 58 km from the Kenya-Uganda border. The district is 119 km from Serere district, which is the target area for piloting short-staple cotton growing. Mbale district was selected due to its proximity to the raw material source.

3.2 Available transportation and logistics

The existing road transport and utility infrastructure facilities such as power, water and information and communication services in the district favour manufacturing activities in the area. The district is home to Uganda's Mbale Industrial and Business Park, with an estimated 250.5 ha. The ginneries within the locality reduce the cost of transporting the short-staple cotton lint and gin waste to the factory. The district has tarmac roads which will favour transportation of the raw material and finished goods to various markets.

3.3 Transportation costs

The ginners or their agents will transport the cotton lint from the ginneries to the factory. Cost of transport will depend on the distance between the ginnery and the factory plant. The cost for transporting un ginned seed cotton to a ginnery ranges between 30-50 Uganda shillings per kilogramme i.e. (US$0.008–0.014). Similarly, the lint supplied by ginners to factories is usually a delivered cost, calculated based on distance to the factory.

3.4 Environmental, health and safety considerations

The absorbent cotton production line will be equipped with advanced technology and a state-of-art filtering dust system that expels cleaned air. The effluent water will be treated suitably to reduce the PH value to neutral. The investor will carry out an Environmental Impact Assessment (EIA) prior to commencement of the Project and shall submit an EIA report to the National Environment and Management Authority (NEMA) for approval before commencement. The EIA is issued by NEMA within 3-6 months. NEMA assists investors to commence operations as soon as possible. The list of Certified EIA consultants is found on their website **www.nema.go.ug.** Environment audits will be conducted annually to ensure that the factory is not emitting miasmas that are hazardous to workers and local communities. All workers will wear protective gear to protect them from inhaling cotton dust and foreign particles.

4. Raw materials and inputs

There are three (3) types of raw materials for the project. These include short staple ginned cotton, gin waste and spinning waste.

Production of short-staple cotton

The country is the process of revamping production of short-staple cotton which is the target raw material for manufacturing absorbent cotton wool in Uganda. Seed multiplication will be carried out by CDO under the existing government initiatives with the Uganda Prisons Commission. Seed multiplication has commenced with the multiplication of four SATU lines, including SATU 71 at the National Semi-Arid Resources Research Institute (NASARRI). The production of short-staple cotton will be isolated from the current BPA. Production and multiplication of the SATU variety will be carried out in Serere, near Lake Kyoga, starting with about 40 ha. The seed will gradually be multiplied to cover large areas in Serere district using the cotton-wave growing system to about 1,200 ha. According to NARO, the SATU variety is high yielding, has greater resistance to bacteria blight and is vigorous in growth.

The other alternative is to zone large parcels of private land and encourage large commercial farmers to grow the crop on a commercial scale.

Using Serere as the target production zone, ginning will be carried out in Kachumbala Ginnery and surrounding ginneries. Production of the cotton will be managed at farm-level using the current ginning programmes. The seed cotton will be hand-picked by the farmers to maintain the superior fibre quality. After the harvest, the intermediary agents will aggregate the seed cotton from the farmers and deliver it to the ginneries. The process prior to delivery will involve direct purchase of the crop from the farmer, storage, additional sorting and delivery of the produce to the ginnery. In

return the ginners will train, coordinate and monitor the agents, and provide them with advance funds, commissions and adequate transport facilities for timely delivery of the seed cotton.

Uganda predominantly uses the roller-gin technology to preserve the quality of the cotton fibre. According to CDO, ginning outturn ranges between 40 and 44 per cent *(Lugojja, 2017)*. Ginneries with installed capacity of less than 15,000 lint bales have a breakeven production level of approximately 3,000 bales, while those with the installed capacity of more than 15,000 bales is between 5,000-6,000 bales *(Lugojja, 2017)*. According to UNCTAD, ginneries can recover short-staple cotton after they clean their seed cotton prior to ginning, and then their lint prior to baling.[7] According to CDO, SATU seeds will be multiplied so as to increase production and yields to an average of about 1,483 kg/ha of seed cotton by 2025.

By 2025 the cultivated seed should have been multiplied by a factor of 150 times to 1,170,000 kg. In 2020 annual production of lint is projected to be about 2,837 bales, it will grow by a factor of 5 times. By 2025, the cumulative production is projected to reach 17,684 bales.

Table 4.1: Projected short-staple cotton production 2020-2025

Period/season	Cotton lint production (bales @ 185 kg)	Earnings from lint sales (US$ million) at a price of US$ 1.65/kg	Earnings by farmers in (Sh. billion)	Short-staple cotton seeds production (kg)
2019	94	0.029	0.075	300
2020	2,837	0.866	2.255	32,000
2021	2,837	0.866	2.255	975,000
2022	2,837	0.866	2.255	975,000
2023	2,837	0.866	2.255	975,000
2024	2,837	0.866	2.255	975,000
2025	3,405	1.039	2.707	1,170,000

***Source**: Author's interview with Cotton Development Organisation, 2019*

Spinning waste

Uganda has two operational textile mills. They source all their lint from ginners. The companies are engaged in spinning, weaving and knitting. During the spinning process into yarn, about 13 per cent of the lint is lost to, waste according to the interview with spinners. There are three types of spin waste produced. These include soft waste, sweeping, and flat strip. The comber noil is also produced during the spinning process and can be mixed with the ginned cotton to produce the raw material for absorbent cotton wool. Findings from one of the spinners revealed that the company produces about 9,000 spindles per month and these translate into about 17 MT of yarn and about 2.2 MT of spinning waste per month.

[7] UNCTAD, 2018. "Promoting cotton by-products in Eastern and Southern Africa." Uganda National Action Plan UNCTAD, New York and Geneva.
UNCTAD/DITC/COM/INF/2018/2. Available at :http://unctad.org/meetings/en/Sessional Documents/1617K Survey Uganda.pdf

Ginning waste

According to CDO, the average ginning out-turn in FY2015/16 was 3.95 per cent process waste. In the same financial year, annual production of lint stood at about 110,707 bales and by 2017/18, production had reached 202,357 bales. The average ginning out-turn of 3.95 per cent process waste implies that Uganda has the capacity of producing 1,740 metric tons of gin waste per annum.

4.1 Types of required inputs/raw materials

The raw material for the project is short-staple ginned cotton, spinning waste and gin waste. In the 1990s, NARO bred the SATU 95 variety of cotton, which yields short, coarse lint fibres suitable for processing into absorbent cotton wool. The coarse-textured lint had a fibre length of approximately 39.02- 42.58 (effective length 32nd inch) i.e. mean 41.37 *(SAAPRI).* The Micronaire values of the SATU 1995 were 3.63-4.46. The fibre length and Micronaire value of the new SATU variety will be verified by CDO after the first harvest and ginning season.

4.2 Raw material availability

CDO in partnership with Uganda Prisons Commission will multiply the SATU seed during the first planting season. Specific areas will be zoned and dedicated towards growing the short-staple cotton variety. According to CDO, Serere district in eastern Uganda is the most suitable area piloted for planting the variety. The seed will be distributed to farmers during the planting season. After harvesting, the seed cotton will be sold by farmers to ginners' agents, ginneries, independent intermediaries, and cooperatives. The ginneries will process the cotton into lint. Other inputs for processing of absorbent cotton wool, such as caustic soda, hydrochloric acid, sulphuric acid, hydrogen peroxide and wetting agents such as indogel are readily available on the local market.

4.3 Competing uses

Currently, there were no competing uses for gin waste and short-staple cotton. Spinning waste on the other hand is purchased for use in making suit pads. Fine spinners sell some of the waste to Kenya and South Africa. Provided an economical supply chain can be established, the supply of raw material will be guaranteed. Inputs such as the bleaching agents are also used by other industries. The supply of these chemicals will be guaranteed since they are widely available on the market.

4.4 Sourcing and logistics

The main suppliers for the lint and gin waste will be ginners. The ginners or their agents will transport the baled lint to the factory. The cost of transport per bale depends on the distance and is integrated into the unit price for the lint. The gin waste is usually half the price of the cotton lint according to the manufacturers of absorbent cotton wool and ginners.

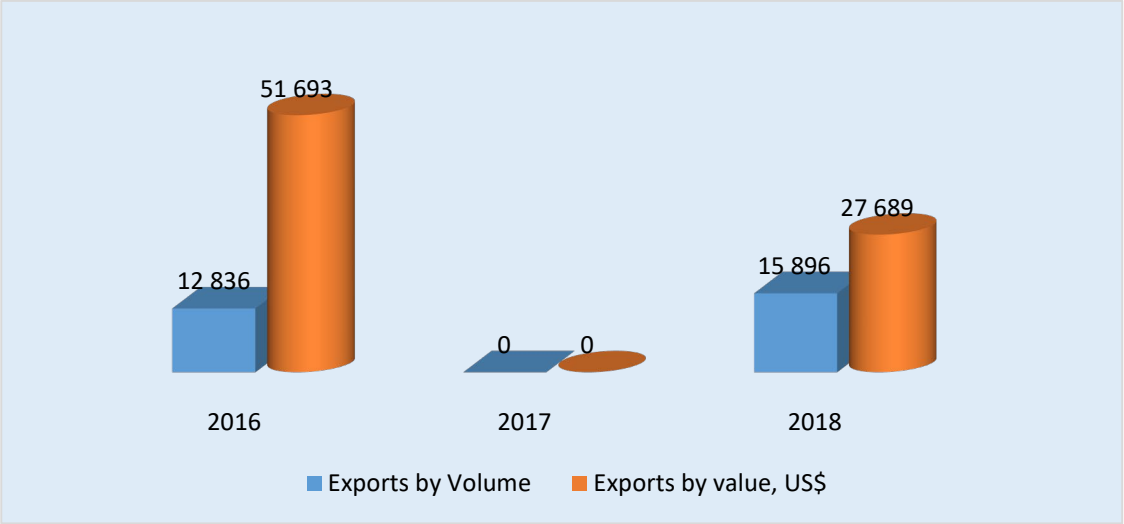
5. Market analysis

5.1 Existing market size

The demand for absorbent cotton wool in Uganda has grown by 50 per cent in the last two years. Ninety per cent of the cotton wool produced locally is sold to National Medical Stores (NMS), Joint Medical Stores (JMS), private pharmacies, supermarkets, hospitals, clinics, and drug shops around the country. Uganda is also a net importer of cotton wool. The import demand was estimated to be

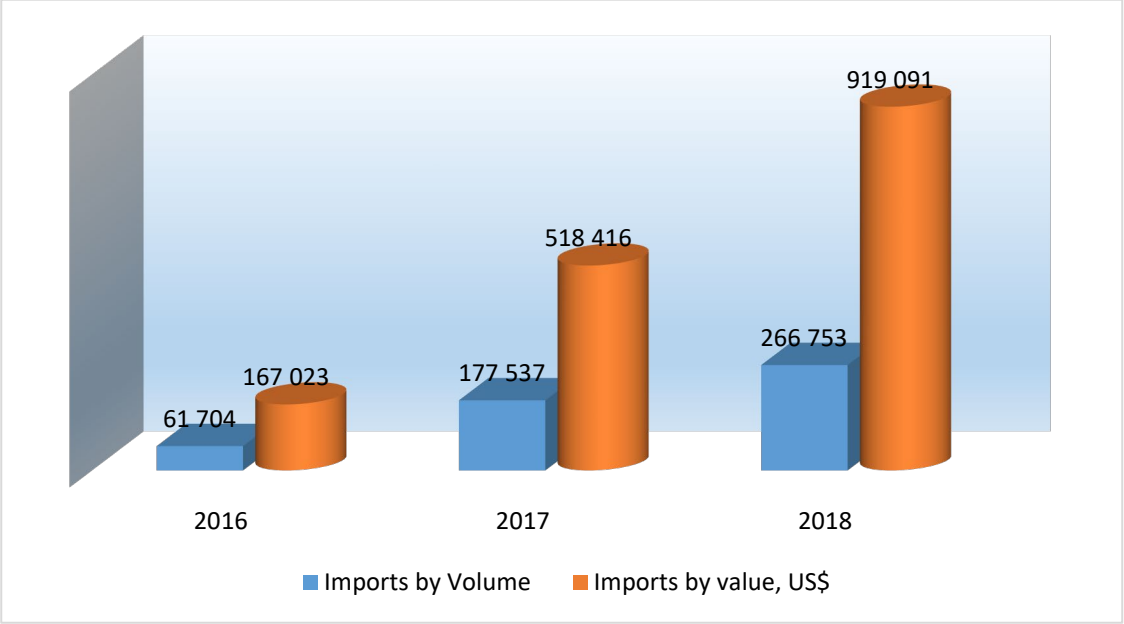
267 metric tons in 2018. NMS and JMS combined, import over 124 MT of absorbent cotton per annum. The regional demand for absorbent cotton wool has also grown steadily within. In 2018, Uganda exported 16 MT of absorbent cotton, up from 12.8 MT in 2016. Countries in the EAC region are the main destination markets for Uganda's cotton wool, including Burundi, Kenya, Rwanda and Tanzania.

Figure 5.1: Exports of absorbent cotton wool in volume and value, 2016-2018



Source: *Uganda Bureau of Statistics, 2019*

Figure 5.2: Imports of absorbent cotton wool in volume and value, 2016-2018



Source: *Uganda Bureau of Statistics, 2019*

5.2 Market access opportunities

EAC countries are prime markets for Uganda's absorbent cotton wool due to duty free access. Uganda also has preferential market access to countries in the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC), following the signing of the 2015 Tripartite Free Trade Area. Market opportunities for absorbent cotton wool

outside Uganda and the EAC continue to grow. Uganda signed the Africa Continental Free Trade Area (AfCFTA) agreement in March 2018. The CFTA gives the industry market access to more than 54 countries. The operational phase for the agreement was launched in July 2019 and ratified by 22 countries in May 2020.

5.2 Marketing and distribution channels

The absorbent cotton wool will be sold to the domestic market. The project will target the two main medical stores (Joint medical stores and National medical stores). The two stores supply the cotton wool to government hospitals, NGOs, and private hospitals. The Buy Uganda Build Uganda Policy aimed to promote consumption and procurement of goods and services produced locally. The project will also target wholesaling and distribution of the product to the wholesale pharmacies, large supermarkets, private clinics, and drug stores. The current selling price for absorbent cotton wool to National medial stores, which purchases almost 40 per cent of the absorbent wool produced in Uganda, is US$ 4.60 per kg. Retail price for absorbent cotton wool is US$ 6.49 per kg. The export market will be explored after satisfying the local market.

6. Indicative factor costs

6.1 Infrastructure

Underlying assumptions are:

a) A borehole will also be sunk on-site from which water shall be pumped using and electric pump to supply the factory. The drilling of bore holes is regulated by the Directorate of Water Resources Management in the Ministry of Water and Environment.

b) Rainwater will also be collected on site and stored in underground tanks for additional use by the plant.

c) The plant will have its own waste disposal facility that will include a septic tank and soak pit which shall be constructed in the first year of the project.

d) Electricity tariffs will be lowered after commissioning Karuma hydro-power plant in 2020.

6.2 Utility and transport

Table 6.1 Selected indicative utility & transportation costs

Category	Description	Unit Cost, US$
Electricity	Medium industry consumers Low voltage of 415 volts (V), with maximum consumption of 500 kVA	0.166
	Large industry consumers High voltage 11,000 V or 33,000 V with consumption between 500 – 1,500 kVA	0.10
	Extra Large industry consumers High voltage 11,000 V or 33,000 V with consumption exceeding 1,500 kVA and dealing in manufacturing	0.085
Internet	Broad band installation	2,000
	Broadband dedicated internet 3 megabits per second (Mbps), per month	800
Telephone	Fixed Line, per second on average	0.0011

Category	Description	Unit Cost, US$
Road	20ft & 40ft container from Mombasa to Mbale, including clearing fees, charges and insurance.	3,300
	20ft & 40 ft Container from Mbale to Mombasa, including clearing fees, charges and insurance	2,200

Note: The proposed plant falls under medium industry category

Table 6.1 illustrates the indicative utility and transport cost for the project. The proposed project is categorised as a medium-sized factory. The electricity tariff for low voltage of 415 volts with maximum consumption of 500 kVA is US$ 0.166 according to the estimates provided by the Electricity Regulatory Authority in Quarter 3 2018/19. Broad band installation for internet is estimated at US$ 2,000. Installation of a fixed telephone line is US$ 0.0011. The cost of transporting a container by road from Mombasa to Mbale is US$ 3,300. Transporting a container from Mbale to Mombasa is US$ 2,200. The cost of transport, internet and a fixed telephone varies according to the service provider.

6.3 Labour

Underlying assumptions are:

a) Proposed rates include health benefits, taxes and social security contributions; and

b) All administrative and production personnel are readily available.

The estimated total number of staff are 58. Three fall within the managerial category, 5 are skilled, 20 are semi-skilled and 30 are casual labourers. The estimated salary per manager is US$ 500. The 5 skilled staff will include electricians, and mechanics among others. The estimated salary per month is US$195. The semi-skilled staff include machine operators, and storekeepers among others. The estimated earnings for this category per month are US$110. The casual labourers will earn US$ 50 per month. The total salaries and staff costs (personnel costs) per annum in year 1 are US$ 101,957.

Table 6.2: Estimated personnel costs for the first year of production

Salaries	No. of staff	Monthly salary (US$)	Total annual salary	NSSF Contribution	Total
Management					
Managerial and administration	3	500	18,000	1,800	19,800
Skilled staff	5	195	11,700	1,170	12,870
Semi-skilled staff	20	110	26,400	2,640	29,040
Casual labourers	30	50	18,000	1,800	19,800
	Total	**855**	**74,100**	**7,410**	**81,510**
Other staff costs	No. of Staff	Unit value per staff year	Annual amount	Total	
Staff Uniforms and Protection Clothing	58	41	2,351		2,351
Meals for staff	58	1	18,096		18,096
Other staff costs			**20,447**	**-**	**20,447**
Total salaries and other staff costs			**94,547**	**7,410**	**101,957**

7. Financial viability analysis

7.1 Underlying assumptions

The following are the underlying assumptions:

1. Purchasing of lint takes place between October and April, during the ginning period. The factory will purchase sufficient volumes of baled lint to enable production all year round.
2. Exchange rate used is US$ 1.00 = UGX 3,700.
3. The production capacity of the absorbent cotton production line is based on a single shift working 8 hours per day. There are 6 working days per week.
4. Conversion rate of lint to cotton wool assumes a ratio of 100:86.
5. Investor contributes 75 per cent equity. 25 per cent balance will be raised from a commercial bank loan, denominated in US$.
6. Funds will be borrowed in US$ from a local bank at interest rates not exceeding 12 per cent for a period of 5 years, including a one-year grace period on the repayment of the principal.
7. Selling prices for raw materials are taken as:

a) US$ 1.65 per kilogramme of cotton lint

b) US$ 0.649 per kilogramme of spinning waste

c) US$ 0.825 per kilogramme of gin waste

8. The SATU variety of cotton, which yields short course lint fibres, will be suitable for producing absorbent cotton wool.
9. CDO will market and popularise growing of short-staple cotton in the zoned area.
10. Intermediary agents will aggregate all the lint and gin waste from ginners and deliver it to the factory.
11. Funds will be mobilized in the 1st year of project implementation.
12. Working capital for the first three (3) months of operations will be available before production commences.

7.2 Implementation schedule

The implementation schedule for year 1 of the project is shown in table 7.1 below. The main activities in year 1 will include selection and acquisition of the site, construction of buildings and factory sheds, securing financing for the project, procurement of machinery, and installation of electricity, machinery and other facilities such as water. All staff will be trained and recruited by end of the 1st year of implementation. Production will commence in January of the 2nd year of implementation, with the plant operating at 60 per cent capacity utilization. The availability of a ready market for short-staple cotton will ensure farmers obtain competitive prices which will subsequently attract farmers to grow the variety. Sales will also commence in the 2nd year of implementation. Selling price of absorbent cotton wool is US$ 4.60 per kilogramme. In year 3, the plant will produce at 75 per cent and increase to 80 per cent capacity utilisation in year 4. 90 per

cent production capacity will be attained in the 5th year of implementation and total sales are expected to reach US$ 1,076,400.

Table 7.1: Implementation schedule

	Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Selection and Acquisition of site												
2	Construction of building and factory sheds												
3	Financial Arrangements												
4	Procurement of Machinery												
5	Installation of electricity, machinery and other facilities												

7.3 Total capital investment

The estimated capital investment of the proposed project is US$ 390,315 as shown in table 7.2. The initial capital investment includes costs for land acquisition and site preparation which includes ground levelling, bush clearing and excavation among others, purchase of machinery, office furniture, computers and accessories, pre-operating expenses, electricity installation, truck and installation of water and drainage system. The investor's own contribution is 75 per cent (US$ 292,736). Long term loan is estimated at 25 per cent which is equivalent to US$ 97,579.

Table 7.2: Estimated capital investment of the project

	Item description	Quantity	Unit cost, US$	Year 1
1	Land and site preparation (1,012 m2)	1	27,024	27,024
2	Civil works and total built up area (607 m2)	1	72,840	72,840
3	Machinery and Equipment	1	173,225	173,225
4	Office Furniture and Equipment	1	9,433	9,433
5	Pre-operating Expenses	1	4,800	4,800
6	Electricity installation	1	45,000	45,000
7	Heavy duty truck (7000 tonnes)	1	42,857	42,857
8	Water system installation	1	15,135	15,135
				390,315
	Capital Structure			
a	Equity (75%)			292,736
b	Long loan debt (25%)			97,579
			Total investment	**$390,315**

7.4 Fixed capital

Fixed capital comprises land, buildings, plant and machinery, drilling a borehole, purchasing a transformer and getting electricity. The total cost of acquisition of land and construction is US$ 99,864. The land to be procured is 1,012 square meters (0.25 acres). 607 square meters of the land will be built. The list of machinery and equipment required for project is shown in (ii) below.

i) Land & Building

S/N	Description	Quantity	Unit Cost	Total cost US$
1.	Land and site preparation (1,012 m^2)	1	27,024	27,024
2.	Civil works and total built up area (607 m^2)	1	72,840	72,840
	Total			**99,864**

ii) Machinery and Equipment

S/N	Description	Units	Unit Cost, US$	Total cost , US$
1.	Wood fired steam boiler 50 kg/hour	1	10,000	10,000
2.	Round Automatic Plucker	1	5,000	5,000
3.	Vertical Opener 200 kg/hour	1	6,000	6,000
4.	Porcupine/Step Cleaner	1	7,000	7,000
5.	Pressure Kier	1	4,000	4,000
6.	Overhead Crane	1	5,000	5,000
7.	Air compressor	1	2,500	2,500
8.	Centrifugal Hydro extractor	1	2,000	2,000
9.	Wet/Humid Cotton opener	1	3,000	3,000
10.	Conveyor Dryer & HAG System	2	15,000	30,000
11.	Hopper Feeder	1	725	725
12.	Lap Former/Blow room line	1	12,000	12,000
13.	Carding Machines with conveyor[8]	3	9,000	27,000
14.	Rolling machines	2	2,100	4,200
15.	Rolls Cutting machine	1	250	250
16.	Water overhead tank of 10,000 L capacity and tube well fitted with accessories	2	600	1,200
17.	Water infrastructure (borehole drilling, rainwater harvesting system, pipe connections with water			7,000
18.	Weighing scale	1	350	350
19.	Testing machine for PH meter, soxhlet-extractor, chemical balance, crucibles, furnace, oven etc		1,000	1,000
20.	Electricity connection and installation charges		45,000	45,000
	Sub Total			173,225
iii)	Office furniture, computers and accessories			9,433

7.5 Working capital

The working capital includes total staff salaries, cost of raw materials, utilities and other contingent expenses. The estimated working capital for the first five years of the project are shown below. The increase in working capital is due to changes in the external business environment such as inflation, staffing costs, utility costs and maintenance among others which may impact the project.

Table 7.3: Working Capital in US$

		Year 1	Year 2	Year 3	Year 4	Year 5
1	Selling, general and administrative costs	169,203	183,715	192,906	201,068	210,242
2	Total cost of raw materials	-	336,062	415,392	442,675	496,073
	Total	169,203	519,777	608,298	643,743	706,315
	Increase	**169,203**	**350,573**	**88,521**	**35,445**	**62,572**

7.6 Financial analysis

a) Profitability (per annum) in US$

The profit and loss statement for the 11 years of the project is summarised in annex V. The net profit at the end of Year 2 is US$ 115,702. Year 3 profit is 182,732. Profits in year 4, and 5 and increase progressively to US$ 287,706 in year 6. The net profit ratio of the project is positive and above 16

[8] 100kgs per hour

per cent starting in year 2. This means that the project will earn more profits from its sales revenue. In addition, the positive ratio which is increasing year on year implies that the investment project is profitable.

Furthermore, the gross margin is growing steadily confirming that the estimated sales prices for absorbent cotton wool are high enough to cover the costs of production.

Table 7.4: Profit and Loss Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Total gross margin	0	381,538	481,608	514,125	580,327	646,465
Total costs	169,203	183,715	192,906	201,068	210,242	219,768
PBID	-169,203	197,824	288,702	313,057	370,085	426,697
Depreciation	30,184	26,281	22,972	20,156	17,751	15,688
Interest	7,806	6,245	4,684	3,123	1,561	
PBT	-207,194	165,297	261,046	289,778	350,773	411,009
Corporation Tax	(62,158)	49,589	78,314	86,933	105,232	123,303
Net Profit	-145,036	115,708	182,732	202,845	245,541	287,706

b) Return on Investment

The return on total capital investment in Year 2 is 39.5 per cent and increases to 62 per cent in year 3. By year 4 the return is 69.3 per cent and 84 per cent in year 5. The increasing return on investment means the project is profitable in comparison to the cost. The investment therefore, is worthwhile.

Table 7.5: Distribution of profits

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PBID	(169,203)	197,824	288,702	313,057	370,085	426,697
Interest	7,806	6,245	4,684	3,123	1,561	-
Depreciation	30,184	26,281	22,972	20,156	17,751	15,688
Operating profit	(207,194)	165,297	261,046	289,778	350,773	411,009
Corporation tax (30%)	(62,158)	49,589	78,314	86,933	105,232	123,303
Profit after tax	(145,036)	115,708	182,732	202,845	245,541	287,706
Return on investment	(49.54)	39.53	62.42	69.29	83.88	98.28

By definition a break-even point describes the sales amount by quantity sales needed required to meet the total costs i.e. fixed and variable costs of the company. Total profit at the break-even point is zero. The break-even sales for year 1 are US$ 359,436, US$ 349,860 in year 2, US$ 352,109 in year 3, 353,127 in year 4, and US$ 356,358 in year 5.

Similarly, the break-even point by units or quantity for year 1 is 78,138, 76,057 in year 2, 76,545 in year 3, 76,767 in year 4, and 77,469 in year 5.

c) Break-even sales and units

Table 7.5: Distribution of profits

Break-even Sales = Total Fixed Costs / (Contribution Margin)							
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Break-even Sales	359,436	349,860	352,109	353,127	356,358	369,088	383,225
Break-Even Units = Total Fixed Costs / (Price per Unit - Variable Cost per Unit)							
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Break-Even Units/quantity	78,138	76,057	76,545	76,767	77,469	80,236	83,310

d) Feasibility

The feasibility of the project is shown in Annex IX. The net present value (NPV) is the summation of the discounted cash flows for years 1 to 11 of the project. The total sum is US$ $3,141,505. The project is feasible.

8. Licences, regulation and standards certifications

8.1 Business licences

An investor in a manufacturing facility for absorbent cotton wool requires the following licences to start business in Uganda:

a) Manufacturing licence for a medical device, and

b) Investment licence.

Surgical cotton is classified as a medical device. The premise of the intended project is licensed and product registered as per section 29 of the Drug registration regulation 2014.

Table 8.1: Licences required

S/N	Name of licence/permit	Cost in US$	Issuing authority	Licence processing time
1.	Manufacturing licence	208[9]	National Drug Authority (NDA)	3 months
2.	Investment licence	free	Uganda Investment Authority	2 days

Procedure for Acquiring a Manufacturing License for Medical Device

i. Submit letter of intention to manufacture to the National Drug Authority.

ii. The Application should be submitted together with the following:

- ✓ Certified copies of the Memorandum and articles of association of the company,
- ✓ Environment Impact Assessment Report from NEMA,
- ✓ Authorisation letter from UIA, and City or Municipal Authorities,
- ✓ Architectural Plan of the site, and
- ✓ Company profile.

[9]Uganda shillings 770,000 – local manufacturers licence 420,000, and suitability of premises licence is 350,000

iii. The documents are reviewed and after satisfactory review, the company is given approval to start construction.

iv. Preliminary inspection is carried out at various stages of construction and setting up of the site including site inspection prior to construction, inspection after completion of the building, and inspection after completion and installation of support systems and equipment.

v. After commissioning of the facility, the company submits a formal application for the Good Manufacturing Practices (GMP) inspection and a licence to manufacture devices with the prescribed fees.

vi. The application is submitted together with the following:

- ✓ A letter requesting for inspection;
- ✓ Completed application form for manufacture of medical devices
- ✓ site master file; and
- ✓ Products to be manufactures

vii. The GMP compliance assessment and licencing of premises to manufacture medical devices is carried out by the Inspectorate Department and approval granted by the technical committee of National Drug Authority.

Procedure for acquiring an investment license

A foreign investor requires a minimum of US$ 100,000 in planned investment in order to secure an investment license from UIA, whereas a local investor's minimum planned investment requirement is US$ 50,000.

In order to acquire the licence, the investor must carry out the following steps:

a) Step 1 - Register the company in Uganda at the URSB and obtain the Memorandum and Articles of Association, and a Certificate of incorporation.

b) Step 2 - Submit an Application by filling the UIA Form 1 and attach Copies of the following documents:

i. Certificate of incorporation,

ii. Memorandum and articles of association,

iii. Business plan,

iv. Bank statement for the company directors,

v. Copy of the land title or tenancy agreement to confirm location,

vi. Passport copy in colour of foreign shareholders or a copy of the national identification for local shareholders,

vii. Bill of lading to confirm importation of machinery (exceptional),

viii. Copy of the secondary license issued by relevant Government institution such as NDA, and

ix. The EIA report/certificate of approval by NEMA

The Investment Licence will be issued online within two days on submission and verification of the required documentation and evidence indicating registration of the business, a business and investment plan, evidence of funds, and proof of location. The whole procedure from incorporation of a company to investment licence application and issuance is laid out comprehensively on the eBiz portal www.ebiz.go.ug.

8.2 Standards testing and quality control

a) Quality control and standards testing for absorbent cotton wool is carried out by UNBS. Standards testing are provided in Uganda's standard catalogue US 704:2014. The standard specifies requirements and methods for testing absorbent cotton wool (surgical cotton wool) for medical use. The standards can be procured at the UNBS information resource centre at a total cost of 35,000 Uganda shillings, equivalent to US$ 9.46.

b) Quality control and standards testing of lint used in the factory is guaranteed by CDO. CDO has a cotton classing laboratory and carries out inspections of ginneries for their suitability. CDO guides farmers and ginners on seed and lint quality as well as packaging requirements. The strict quality control mechanisms ensure that the raw material for manufacturing absorbent cotton wool meets international standards.

9. Availability of labour and specialised skills

Uganda has a ready supply of skilled and semi-skilled workforce for the absorbent cotton wool industry. The existing manufacturers and expatriates have provided practical training of the local manpower in the industry. Potential investors therefore, will find it relatively easy to hire suitable trained and trainable human resource. The labour rates for unskilled labour are also competitive, ranging between US$ 1.08 -1.35 per day. In addition the technical colleges and universities such as Makerere University Kampala, Busitema University, Uganda Technical College Elgon, Uganda Martyrs University, Uganda Christian University, and Makerere University Business School provide a regular supply of trainable young workforce including chemists, mechanics, electricians, accountants, and managers, suitable for working in the factory.

10. Tax and non-tax incentives

Uganda provides various tax and non-tax incentives to attract new investments in the country. The tax varies according to sectors or industry. Investors are encouraged to engage relevant government institutions such as the Uganda Investment Authority or Uganda Revenue Authority to obtain information on tax incentives before investment. Both domestic and foreign investors are entitled to these incentives.

10.1 Tax incentives

An investor in absorbent cotton wool can benefit from the following tax incentives in accordance with tax law in Uganda:

a) VAT deferment on plant and machinery is applicable, where payment of VAT at importation on specified imports is postponed to a future date. The cost of the plant and machinery should be at least US$ 22,500 and above.

b) Industrial replacement spares parts used exclusively on industrial machinery classified in Chapters 84 and 85 of the EAC Common External Tariff are exempted from all taxes under the Fifth schedule of the East African Community Customs Management Act, 2004.

c) VAT is deferrable for pre-fabricated buildings for factory use imported by registered manufacturers or other entities such as warehouse construction companies.

d) 100 per cent training expenditure on scientific research is allowed for Ugandan employees as a deduction for income tax.

e) An initial capital deduction of 50 per cent is allowed on plant and machinery and 20 per cent on industrial buildings situated in the radius of 50 kilometers from Kampala.

f) Assessed losses in one year are carried forward as a deduction against the following year of income.

g) Refund of excise duty paid is granted on medical products approved by Ministry of Finance, Planning and Economic Development in consultation with Ministry of Health.

h) 10-year Income Tax Exemption is granted to manufacturers and exporters of consumer or capital goods. The exemption is granted if at least 80 per cent of the raw materials are sourced in Uganda and 80 per cent of the manufactured goods are exported.

i) Taxpayers with commercial buildings that are also used as offices are given an industrial building depreciation allowance at a rate of 5 per cent for 25 years.

j) VAT is exempt on supplies to Free Zone and Industrial Park developers. The investment threshold should be at least US$ 50 million.

k) VAT Supplies are exempt to operators within an industrial park, free zone or single factories outside industrial parks or free zones with a capital investment of US$ 15 million for foreigners and US$ 10 million for citizens.

l) VAT is exempted to an operator on services to conduct a feasibility study and design, locally produced materials for construction of a factory or warehouse and locally produced raw materials and inputs or machinery and equipment. This is on condition that 70 per cent of raw materials are sourced locally subject to availability and the company directly employs a 60 per cent of citizens.

m) Six per cent withholding tax exemptions for Uganda Revenue Authority compliant taxpayers.

n) No stamp duty on instruments executed by developers and operators of free zones.

o) No excise duty on construction materials for factory or warehouse exclusive of those on local market, locally produced raw materials and inputs to operators in an industrial park, free zone, single factory or other business outside the Park or Free Zone who meets listed requirements.

10.2 Non-tax benefits

An investor can also benefit from the following:

a) Bilateral Investment and Trade Agreements (BITs)

Uganda has entered into a number of BITs agreements for the promotion and protection of investment in Uganda. The BITs provide best investment practices, guarantee against expropriation, national treatment and non-discrimination, compensation for losses, repatriation of investment and returns, and dispute settlement among others, etc.

These include agreements with the following countries: Denmark, Egypt, France, Germany, Italy, Netherlands, South Africa, Switzerland and the United Kingdom.

b) Double Taxation Agreements (DTAs)

Uganda has signed Double Taxation Agreements with the following countries: India, South Africa, Denmark, Mauritius, Netherlands, Norway and the United Kingdom.

c) National Treatment and Non-discrimination

i. Uganda does not restrict the percentage of equity that foreign nationals may hold in a locally incorporated company. In the same way, the country has no rules or regulations restricting joint-venture arrangements between locals and foreigners or prohibiting the acquisition of Ugandan firms by foreign-owned firms.

ii. Uganda imposes no limit on equity ownership. Investors are free to bring in and take out their capital. In practice, a company faces no obstacles in divesting from its assets in Uganda.

iii. Non-citizens can lease land for up to 99 years.

iv. Entry and work permits are usually granted to key personnel of foreign enterprises approved to operate in Uganda. Any enterprise, local or foreign, can recruit expatriates for any category of skilled manpower where Ugandans are not available. In this case, however, the investor must prove the need for such employees.

v. Investors can invest in any part of Uganda, as long as security and environmental laws are observed. Investments are not permitted in protected areas.

11. Applicable taxes

The following taxes may apply to the investor depending on the goods and services supplies:

a) Import duty (4, 6 or 7 per cent) COMESA rates, and 0, 8, 10, 25 and above 25 per cent for various sensitive goods under the EAC Common External Tariff.

b) 30 per cent is corporate tax applicable on corporate profits.

c) Six per cent withholding tax is applicable to some goods and services transactions and for imported goods.

d) An Environment levy on imported used goods such as vehicles.

e) 18 per cent value added tax (VAT) for supplies.

f) Infrastructure levy may also be applicable.

NOTE: *The investor should consult URA Customs department for advice on applicable taxes before a consignment is brought into the country.*

12. Security of investment

Security of investment in Uganda is guaranteed by the Constitution of Uganda, and the Investment Code Act of 2019.

Uganda is also a signatory to major international trade and investment-related institutions including: the Multi-lateral Investment Guarantee Agency, Overseas Private Investment Corporation, Convention on the recognition and enforcement of foreign arbitral award, Islamic

Corporation for the Insurance of Investment and Export Credit (ICIEC), International Centre for Settlement of Investment Disputes, and the Agreement on Trade-Related Aspects of Intellectual Property Rights, among others.

13. Risks and mitigation strategies

The investment profile is based on assumptions. Unanticipated alterations of the environment may occur affecting the implementation of the project. The potential risks identified are based on the information collected at the time of developing the profile. The proposed mitigation measures can be planned in advance and considered during commencement and implementation of the project.

Table 13.1: Risk Analysis

	Risk	Probability H/M/L	Impact S/M/L	Mitigation	Responsibility
1	Farmers are reluctant to venture into the growing of short-staple cotton variety due to uncertainty of the market.	**M**	**S**	Sensitise and popularise the SATU variety among farmers, ginners and absorbent cotton manufacturers	Cotton Development Organisation
2	Volumes of the SATU variety remain low	**M**	**S**	Identify and Zone expansive areas of land for planting the Variety	Cotton Development Organisation
3	SATU variety is not suitable for absorbent cotton production.	**L**	**S**	Continuous Research on appropriate varieties for absorbent cotton production	Cotton Development Organisation
4	Failure to attract Investors in Surgical Cotton production	**L**	**S**	Marketing and Investor targeting. Awareness creation of Opportunities	Uganda Investment Authority

Key:

Probability/Likelihood

H- High

M- Moderate

L- Low

Impact/Consequence

S-Severe

M-Moderate

L-Low

References

Ahmed, M., & Ojangole, S. (2010). Analysis of Incentives and Disincentives for cotton in Uganda. Food and Agriculture Organisation of the United Nations (FAO), Monitoring African Food and Agriculture Policies Project (MAFAP). Rome: Food and Agriculture Organisation of the United Nations (FAO).

Anap,G.R. (2009). Prospects of Cotton Stalk Based Particle Board Industries in African Countries and Possible Supply Chain Strategies. Presented at CFC/ICAC Workshop on Utilisation of Cotton By-produce for Value-added Products, Nagpur, India, 9-11 November. ICAC, Washington, D.C.

Horna, D., Kyotalimye, M. & Falck-Zepeda, J. (2009). Cotton production in Uganda: Would GM technologies be the solution? Presented at the International Association of Agricultural Economists Conference, Beijing, China, 16-22 August

Hunter, L., Textiles: Some technical information and data Part V: Cotton Special publication of South African wool and textile research institute of the CSIR Retrievedfrom:https://researchspace.csir.co.za/dspace/bitstream/handle/10204/4719/Hunter%20L_1.pdf?sequence=1&isAllowed=y

Lugojja, F (2017) Cotton and it's by Products in Uganda. Background Paper. United Nations Conference on Trade and Development, New York and Geneva

Mukiibi, J.K. (2001). Agriculture in Uganda. Vol II. Crops. Fountain Publishers/CTA/NARO.pp.322-375.

Ministry of Finance, Planning and Economic Development, (MFPED) 2018. Background to the Budget Fiscal Year 2018/19 Retrieved from: https://finance.go.ug/publication/background-budget-fiscal-year-2018-2019

National Planning Authority, (2015). National Development Plan (NDP) II 2015/16 - 2019/20.https://consultations.worldbank.org/Data/hub/files/consultation-template/materials/ndpii-final11.pdf

Okuja, J., 2018. Domestic Tax Laws of Uganda 2018 Edition TASLAF Advocates and Consultants.

Uganda Bureau of Statistics, 2018. 2018 Statistical Abstract. Kampala: Government of Uganda. Retrieved from: https://www.ubos.org/wpcontent/uploads/publications/01_2019STATISTICAL_ABSTRACT_2019.pdf

Shinyekwa, I. et al. (2018) Cotton and it's by Products in Uganda. Analysis of cotton by-products survey. United Nations Conference on Trade and Development, New York and Geneva

Annex I: Useful contacts

1. **Uganda Investment Authority**
TWED Plaza
Plot 22B, Lumumba Avenue
P.O. Box 7418, Kampala
Tel+ 256 414 301000
Fax+ 256 414 342903
Email: info@ugandainvest.go.ug
www.ugandainvest.go.ug

2. **National Drug Authority**
Secretariat office Kampala
Plot 19 Lumumba Avenue
Tel: +256 417 788 100; +256 417 788 124
Email: ndaug@nda.or.ug
Website: www.nda.or.ug

3. **Cotton Development Organisation**
Cotton House
Plot 15 Clement Hill Road
Tel: +256 414 230309
Email: cdo@africaonline.co.ug
www.cdo.uga.org

4. **National Environment Management Authority**
NEMA House
Plot 17/19/21, Jinja Road
P.O. Box 22255, Kampala
Tel:+256 4 14 251064/5/8
Email: info@nemaug.org
www.nemaug.org

5. **Uganda National Bureau of Standards**
Standards House
Bweyogerere Industrial Park,
Plot 2 - 12, Kyaliwajala Road,
P.O Box 6329 Kampala, Uganda
Tel: + 256 417333250
Email: info@unbs.go.ug
www.unbs.go.ug

6. **Uganda Revenue Authority**
URA Tower
Nakawa Industrial Area
Plot M193/194
P.O. Box 7279, Kampala
Tel: +256 0800117000
Email: services@ura.go.ug
www.ura.go.ug

7. **Uganda Manufacturers Association**
Lugogo show grounds
P.O. Box 6966, Kampala
Tel:+256 414220 285
Email: information@uma.co.ug
www.uma.or.ug

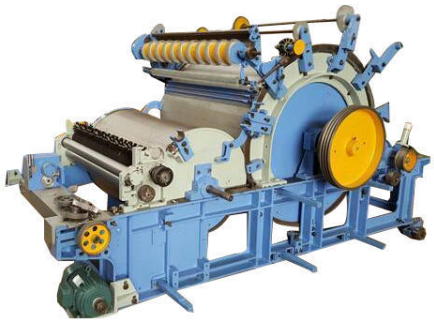
8. **Private Sector Foundation Uganda**
Plot 43 Nakasero road
P.O. Box 7683, Kampala
Tel: +256 414 230 956
Email:psfu@psfuganda.org
www.psfuganda.org

9. **Uganda National Chamber of Commerce and Industry**
P.O. Box 3809, Kampala
Tel: +256 4 503024/36
Email: infor@ugandachamber.com
www.ugandachamber.com

10. **Uganda Ginners and Cotton Exporters Association**
Plot 15A Clement Hill Road,
Ruth Towers Building
P.O. Box 7018, Kampala
Tel: +256 414 255970
Email: cginners@gmail.com
www.ugcea.com

Annex II: Plant and machinery in pictures

Steam boiler



Carding machine

Blow room lap former

Plant and machinery in pictures (cont.)

Overhead crane

Cotton opener machine

Auto Feeder hopper

33Kv power Transformer

Annex III: Long repayment schedule

Long- Loan schedule	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Term Loan Required	97,579					
Opening Loan Balance	0	97,579	78,063	58,547	39,031	19,516
Loan Repayment	0	19,516	19,516	19,516	19,516	19,516
Closing Loan Balance	97,579	78,063	58,547	39,031	19,516	0
Interest on Loan (8%)	7,806	6,245	4,684	3,123	1,561	0
Front End Fee (1%)	976	0	0	0	0	0
Loan Insurance (3%)	2,927	0	0	0	0	0
Total Annual Debt Service	11,709	25,761	24,200	22,638	21,077	19,516
Monthly debt service	976	2,147	2,017	1,887	1,756	1,626

Annex IV: Sales revenue statement (US$)

	Year1	Year2	Year3	Year4	Year 5	Year 6	Year 7	Year8	Year9	Year10	Year11
Installed Capacity (MT)	260	260	260	260	260	260	260	260	260	260	260
Capacity Utilisation (%age)	0%	60%	75%	80%	90%	100%	100%	100%	100%	100%	100%
Quantity of absorbent cotton wool produced (Kg)	-	156,000	195,000	208,000	234,000	260,000	260,000	260,000	260,000	260,000	260,000
Price per kg in US$	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Value of total sales of cotton wool	0	717,600	897,000	956,800	1,076,400	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000
Less direct costs											
Cotton Lint											
Amount of cotton link (100:86 conversion rate)		181,395	226,744	241,860	272,093	302,326	302,326	302,326	302,326	302,326	302,326
Unit price of lint per kg	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Cost of Lint	0	299,302	374,128	399,070	448,953	498,837	498,837	498,837	498,837	498,837	498,837
Gin Waste											
Amount of Gin Waste (kgs)	0	4,160	5,200	5,547	6,240	6,933	6,933	6,933	6,933	6,933	6,933
Unit price of Gin Waste per kg	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Cost of Gin Waste	0	3,432	4,290	4,576	5,148	5,720	5,720	5,720	5,720	5,720	5,720
Comber noil/ spinning waste											
Amount of comber noil	0	6,240	7,800	8,320	9,360	10,400	10,400	10,400	10,400	10,400	10,400
Unit price of comber noil per kg	0.65	0.65	0.65	0.65	0.65	0.65	$0.65	0.65	0.65	0.65	0.65
Cost of comber noil	0	4,050	5,062	5,400	6,075	6,750	6,750	6,750	6,750	6,750	6,750
Caustic Soda											
Amount of Caustic Soda	$0	2,184	2,730	2,912	3,276	3,640	3,640	3,640	3,640	3,640	3,640
Unit price of Caustic Soda per kg	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Cost of Caustic Soda	0	2,359	2,948	3,145	3,538	3,931	3,931	3,931	3,931	3,931	3,931
Hydrogen peroxide											
Amount of Hydrogen peroxide	0	550	688	733	825	917	917	917	917	917	917
Unit price of Hydrogen peroxide per kg	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12
Cost of Hydrogen peroxide	0	616	770	821	924	1,027	1,027	1,027	1,027	1,027	1,027
Hydrochloric Acid											
Amount of Hydrochloric Acid	0	1,517	1,896	2,023	2,276	2,528	2,528	2,528	2,528	2,528	2,528
Unit price of Hydrochloric Acid	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81

	Year1	Year2	Year3	Year4	Year 5	Year 6	Year 7	Year8	Year9	Year10	Year11
Cost of Hydrochloric Acid	0	1,229	1,536	1,638	1,843	2,048	2,048	2,048	2,048	2,048	2,048
Wetting agent (Indogel)											
Amount of Wetting agent (Indogel)	0	500	625	667	750	833	833	833	833	833	833
Unit price of wetting agent per kg	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
Cost of wetting agent	0	810	1,013	1,080	1,215	1,350	1,350	1,350	1,350	1,350	1,350
Cost of packaging materials		840	1,050	1,120	1,260	1,400	1,400	1,400	1,400	1,400	1,400
Cost of Firewood for the boiler	0	23,424	24,595	25,825	27,116	28,472	29,896	31,390	32,960	34,608	36,338
Total cost of raw materials	0	336,062	415,392	442,675	496,073	549,535	550,958	552,453	554,023	555,671	557,401
Gross Margin	0	381,538	481,608	514,125	580,327	646,465	645,042	643,547	641,977	640,329	638,599
Total Annual Gross Margin	**0**	**381,538**	**481,608**	**514,125**	**580,327**	**646,465**	**645,042**	**643,547**	**641,977**	**640,329**	**638,599**

Annex V: Profit and loss statement (US$)

	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11
Total gross margin	**0**	**381,538**	**481,608**	**514,125**	**580,327**	**646,465**	**645,042**	**643,547**	**641,977**	**640,329**	**638,599**
Selling, general and admin costs											
Salaries and other staff costs	101,957	107,055	112,408	118,028	123,930	130,126	136,633	143,464	150,637	158,169	166,078
Occupancy Costs (water and electricity)	41,482	42,726	44,008	45,328	46,688	48,089	49,531	51,017	52,548	54,124	55,748
Office Running Costs	15,958	16,437	16,930	17,438	17,961	18,500	19,054	19,626	20,215	20,821	21,446
Sales and marketing	0	7,631	9,632	10,282	11,607	12,929	12,901	12,871	12,840	12,807	12,772
Insurance costs	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903
Equipment Maintenance	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903	3,903
Audit and legal fees	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688
Total	**169,203**	**183,715**	**192,906**	**201,068**	**210,242**	**219,768**	**228,314**	**237,244**	**246,579**	**256,337**	**266,538**
PBID	**-169,203**	**197,824**	**288,702**	**313,057**	**370,085**	**426,697**	**416,728**	**406,302**	**395,398**	**383,992**	**372,061**
Depreciation	30,184	26,281	22,972	20,156	17,751	15,688	13,913	12,379	11,049	9,892	8,881
Interest	7,806	6,245	4,684	3,123	1,561	-	-	-	-	-	-
PBT	-207,194	165,297	261,046	289,778	350,773	411,009	402,815	393,923	384,349	374,100	363,180
Corporation Tax	62,158)	49,589	78,314	86,933	105,232	123,303	120,845	118,177	115,305	112,230	108,954
Net Profit	**-145,036**	**115,708**	**182,732**	**202,845**	**245,541**	**287,706**	**281,971**	**275,746**	**269,044**	**261,870**	**254,226**

Annex VI: Working capital (US$)

	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11
Selling, general and admin costs	169,203.1	183,714.9	192,905.7	201,068.2	210,242.2	219,768.5	228,313.5	237,244.5	246,579.4	256,337.2	266,537.7
Total cost of raw materials	-	336,061.6	415,392.2	442,675.1	496,072.6	549,534.6	550,958.2	552,453.0	554,022.5	555,670.5	557,400.9
Total	169,203.1	519,776.5	608,297.9	643,743.3	706,314.8	769,303.1	779,271.8	789,697.5	800,601.9	812,007.7	823,938.6
Increase	**169,203.1**	**350,573.4**	**88,521.4**	**35,445.4**	**62,571.5**	**62,988.3**	**9,968.6**	**10,425.7**	**10,904.4**	**11,405.8**	**1,930.9**

Annex VII: Return on investment (US$)

	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11
PBID	(169,203)	197,824	288,702	313,057	370,085	426,697	416,728	406,302	395,398	383,992	372,061
Interest	7,806	6,245	4,684	3,123	1,561	-	-	-	-	-	-
Depreciation	30,184	26,281	22,972	20,156	17,751	15,688	13,913	12,379	11,049	9,892	8,881
Operating profit	(207,194)	165,297	261,046	289,778	350,773	411,009	402,815	393,923	384,349	374,100	363,180
Corporation tax (30%)	(62,158)	49,589	78,314	86,933	105,232	123,303	120,845	118,177	115,305	112,230	108,954
Profit after tax	(145,036)	115,708	182,732	202,845	245,541	287,706	281,971	275,746	269,044	261,870	254,226
Return on investment (%)	(49.54)	39.53	62.42	69.29	83.88	98.28	96.32	94.20	91.91	89.46	86.84

Annex VIII: Cash flow statement (US$)

	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11
SOURCES:-											
Profit after tax	(145,036)	115,708	182,732	202,845	245,541	287,706	281,971	275,746	269,044	261,870	254,226
Depreciation	30,184	26,281	22,972	20,156	17,751	15,688	13,913	12,379	11,049	9,892	8,881
Long Term Loan	97,579	-	-	-	-	-	-	-	-	-	-
Promotor's Contribution	292,736	-	-	-	-	-	-	-	-	-	-
TOTAL SOURCES	275,463	141,989	205,704	223,001	263,292	303,394	95,884	88,125	80,093	271,762	263,107
USES:-											
Capital expenditure	390,315	-	-	-	-						
Working capital	169,203	350,573	88,521	35,445	62,572	62,988	9,969	10,426	10,904	11,406	11,931
Repayment of Term Loan + Interest	11,709	25,761	24,200	22,638	21,077	19,516	-	-	-	-	-
TOTAL USES	571,227	376,334	112,721	58,084	83,649	82,504	9,969	10,426	10,904	11,406	11,931
Opening cash	-	(295,764)	(530,109)	(437,125)	(272,208)	(92,565)	128,326	414,241	691,940	961,129	1,221,486
Surplus/(deficit)	(295,764)	(234,345)	92,984	164,917	179,643	220,890	285,915	277,700	269,189	260,356	251,176
CLOSING CASH	(295,764)	(530,109)	(437,125)	(272,208)	(92,565)	128,326	414,241	691,940	961,129	1,221,486	1,472,662

Annex IX: Discounted cash flow statement (US$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Net flow	(295,764)	(530,109)	(437,125)	(272,208)	(92,565)	128,326	414,241	691,940	961,129	1,221,486	6,381,536
DISCOUNTING:											
REQUIRED RATE OF RETURN	8%										
Discounting Factor	0.93	0.86	0.79	0.74	0.68	0.63	0.58	0.54	0.50	0.46	0.43
Discounted Cash flow	-273,855	-454,483	-347,004	-200,081	-62,998	80,867	241,705	373,834	480,804	565,784	2,736,931
Net Present Value	3,141,505										

Annex X: Management, occupancy and office running costs

Management, occupancy and office running costs (US$)					
Salaries	**No. of staff**	**Monthly salary (US $)**	**Total Annual salary**	**NSSF Contribution**	**Total**
Managerial and administration	3	500	18,000	1,800.00	19,800.00
Skilled staff	5	195	11,700	1,170.00	12,870.00
Semi-skilled staff	20	110	26,400	2,640.00	29,040.00
Casual labourers	30	50	18,000	1,800.00	19,800.00
Total Salaries		**855**	**74,100**	**7,410**	**81,510**
Other Staff Costs	**No. of Staff**	**Unit value per staff year**	**Annual amount**	**Total**	
Staff Uniforms and Protection Clothing	58	41	2,351		2,351.35
Meals for staff	58	1	18,096		18,096.00
Total Other Staff Costs			**20,447**	**-**	**20,447**
Total Salaries and Other staff Costs			**94,547**	**7,410**	**101,957**
Occupancy Costs					
Item	**Unit**	**Quantity per month**	**Unit price (US$)**	**Total monthly**	**Total annual (US$)**
Electricity	Kilo watts	20,000	0.166	3,320.00	39,840.00
Water	mm*3	150	0.912	136.80	1,641.60
Total Occupancy Costs		**20,150**		**3,456.80**	**41,481.60**
Office Running Costs				-	
Item	Number	Unit Cost	Total per annum		Total amount (US$)
Stationery (reams of paper)	24	17,000	408,000	110.27	
Box and Arch Files	24	6,500	156,000	42.16	
Photocopying and Printing toner (cartridge)	8	280,000	2,240,000	605.41	
Telephone	12	300,000	3,600,000	972.97	
Office sundries	12	100,000	1,200,000	324.32	
Internet connectivity/services	12	300,000	3,600,000	972.97	
Fuel for vehicles (70,000 every day)	52	420,000	21,840,000	5,902.70	
Other contingent expenses	52	500,000	26,000,000	7,027.03	
Total Office Running Costs		**1,923,500**	**59,044,000**	**15,957.84**	
Total Management, Occupancy and Office Running Costs				**159,396.79**	
		Monthly average		**13,283.07**	

Annex XI: Break-even Analysis

	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11
Fixed costs											
Salaries and other staff costs	101,957	107,055	112,408	118,028	123,930	130,126	136,633	143,464	150,637	158,169	166,078
Insurance costs	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1
Equipment Maintenance	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1	3,903.1
Audit and legal fees	2,000.0	2,060.0	2,122	2,186	2,251	2,319	2,388.1	2,460	2,534	2,6105	2,688
Office Running Costs	15,957.8	16,436.6	16,929.7	17,437.6	17,960.7	18,499.5	19,054.5	19,626.1	20,214.9	20,821.4	21,446.0
Depreciation	30,184.3	26,281.1	22,972.1	20,156.2	17,750.7	15,688.1	13,912.8	12,379.0	11,049.1	9,891.9	8,881.4
Interest	7,806.3	6,245.0	4,683.8	3,122.5	1,561.3	-	-	-	-	-	-
Total fixed costs	***165,712.1***	***165,884.2***	***166,921.6***	***168,736.4***	***171,259.8***	***174,438.7***	***179,794.3***	***185,735.4***	***192,241.3***	***199,298.4***	***206,899***
Variable costs											
Total cost of raw materials	-	336,061.6	415,392.2	442,675.1	496,072.6	549,534.6	550,958.2	552,453.0	554,022.5	555,670.5	557,401
Occupancy costs (water and electricity)	41,481.6	42,726.0	44,007.8	45,328.1	46,687.9	48,088.5	49,531.2	1,017.1	52,547.6	54,124.1	55,748
Sales and marketing	-	7,630.8	9,632.2	10,282.5	11,606.5	12,929.3	12,900.8	12,870.9	12,839.5	12,806.6	12,772.0
total variable costs	***41,481.6***	***386,418.4***	***469,032.2***	***498,285.6***	***554,367***	***610,552.5***	***613,390.3***	***616,341.1***	***619,409.7***	***622,601.2***	***625,921***
Revenues											
Quantity of absorbent cotton wool produced (Kg)	-	156,000	195,000	208,000	234,000	260,000	260,000	260,000	260,000	260,000	260,000
Price per kg in US$	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
Value of total sales of cotton wool	-	717,600	897,000	956,800	1,076,400.0	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000	1,196,000
Contribution margin *Contribution Margin = 1 - (Variable Costs / Revenues)*		0.46	0.48	0.48	0.48	0.49	0.49	0.48	0.48	0.48	0.48
Break-even Sales *Break-even Sales = Total Fixed Costs / (Contribution Margin)*		**359,435.8**	**349,859.7**	**352,109**	**353,127**	**356,358**	**369,088**	**383,225**	**398,759**	**415,698**	**434,065**
Break-Even Units/quantity (Break-Even Units = Total Fixed Costs / (Price per Unit - Variable Cost per Unit))		**78,138.2**	**76,057**	**76,545**	**76,767**	**77,469**	**80,236**	**83,310**	**86,687**	**90,369**	**94,362**

Annex XII: Book value

	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11
Civil works and total built up area (607 m2)	72,840.0	70,436.3	68,111.9	65,864.2	63,690.7	61,588.9	59,556.4	57,591.1	55,690.6	53,852.8	52,075.6
Machinery and Equipment	173,225.0	155,902.5	140,312.3	126,281.0	113,652.9	102,287.6	92,058.9	82,853.0	74,567.7	67,110.9	60,399.8
Office Furniture and Equipment	9,433.3	7,546.7	6,037.3	4,829.9	3,863.9	3,091.1	2,472.9	1,978.3	1,582.7	1,266.1	1,012.9
Heavy duty truck (7000 tonnes)	42,857.1	34,285.7	27,428.6	21,942.9	17,554.3	14,043.4	11,234.7	8,987.8	7,190.2	5,752.2	4,601.8
Depreciation											
Civil works and total built up area (607 m2)	2,403.7	2,324.4	2,247.7	2,173.5	2,101.8	2,032.4	1,965.4	1,900.5	1,837.8	1,777.1	1,718.5
Machinery and Equipment	17,322.5	15,590.3	14,031.2	12,628.1	11,365.3	10,228.8	9,205.9	8,285.3	7,456.8	6,711.1	6,040.0
Office Furniture and Equipment	1,886.7	1,509.3	1,207.5	966.0	772.8	618.2	494.6	395.7	316.5	253.2	202.6
Heavy duty truck (7000 tonnes)	8,571.4	6,857.1	5,485.7	4,388.6	3,510.9	2,808.7	2,246.9	1,797.6	1,438.0	1,150.4	920.4
	30,184.3	26,281.1	22,972.1	20,156.2	17,750.7	15,688.1	13,912.8	12,379.0	11,049.1	9,891.9	8,881.4