



# **PROMOTING COTTON BY-PRODUCTS**

## **in Eastern and Southern Africa**



# **Zambia**

## **National action plan**

Agreed by consensus at the multi-stakeholder national workshop

Southern Sun Ridgeway Hotel, Lusaka, Zambia, 7 December 2017

Validated by Mrs. Kayula Siame, Permanent Secretary, Ministry of  
Commerce, Trade and Industry, Zambia

29 July 2019

Project 1617K – Founded by the United Nations Development Account – 2016-2020

UNCTAD/DITC/COM/INF/2019/9

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## Summary

The participants of the national workshop on “Promoting cotton by-products in Zambia” recommend, by consensus, the following National Action Plan to develop value added activities on cotton by-products in Zambia. The plan includes two commercial initiatives:

1. Apply absorbent cotton technologies to produce sanitary napkins for girls and women; and
2. Develop a new value chain for cotton stalks.

Participants also propose a multi-stakeholder committee to oversee the implementation of these initiatives, the related activities of the UNCTAD technical cooperation project, as well as any follow-up activities.

The following section introduces the national workshop and the context for this National Action Plan, while the subsequent sections provide a detailed description of the proposed initiatives and oversight committee.

The National Action Plan was validated on 29 July 2019 by Mrs. Kayula Siame, Permanent Secretary, Ministry of Commerce, Trade and Industry, Zambia (see attached official validation in Annex 1).

## Introduction

The United Nations Conference on Trade and Development (UNCTAD) and the Ministry of Commerce, Trade and Industry organised a three-day national capacity-building workshop in Lusaka on 6-8 December 2017, as part of the technical cooperation project “Promoting cotton by-products in Eastern and Southern Africa”. Approximately 66 participants attended the workshop, including policy makers, researchers and stakeholders from the cotton value chain.

The objectives of the workshop included: a) equipping stakeholders to identify priority value added activities on cotton by-product to develop in Zambia; and b) assisting government officials in drafting evidence-based policies to support the identified initiatives. Correspondingly, the national workshop comprised a two-day programme for stakeholders (6-7 December) and a one-day programme for policy makers (8 December).

During the stakeholder component of the workshop, participants agreed on a National Action Plan for developing cotton by-products in Zambia, detailed below.

In support of the National Action Plan, participants at the policy-making component of the workshop agreed by consensus on the following policy recommendations:

1. Promote Zambian cotton products and by-products as part of a national “Buy Zambian” campaign;
2. Strengthen the Cotton Act;
3. Improve coordination among stakeholder groups;
4. Build awareness among stakeholders, especially farmers, about opportunities in cotton by-products; and
5. Create a centre of excellence for the cotton value chain.

At the request of participants, UNCTAD drafted the agreed recommendations, to submit alongside the National Action Plan, for validation by the Permanent Secretary of Commerce, Trade and Industry.

## Initiative 1: Apply absorbent cotton technologies to produce sanitary napkins for girls and women

### Background

Ginneries often clean the seed cotton they buy prior to ginning. After processing, they often clean the lint again before baling. Cleaning results in losses, including in the form of short-staple cotton.<sup>1</sup> With no commercial applications for short-staple cotton in Zambia, ginneries either use it as fuel in their boilers, or dispose of it by burning. In other words, Zambia adds little value to its short-staple cotton.

A variety of technologies now exist to process short-staple fibres into absorbent cotton, used in fabricating, for example, security and currency paper, ear buds and a variety of medical cotton products, including sanitary napkins.

In this context, the participants proposed importing absorbent cotton technologies from India to produce sanitary napkins for girls and women in Zambia. For efficiency, they proposed installing the machines on a pilot basis at the Mumbwa Farmers Ginning and Pressing Company in Central Province. The pilot phase of this initiative will inform whether this product line is economically viable in Zambia, including whether there is a sufficient supply of short-staple cotton fibres to warrant an expansion to other products or firms.

### Business case

Below is a summary of the investment, financial and marketing components of the business case for establishing an absorbent cotton plant with an annual capacity of 260 metric tonnes (MT).

Establishing a pilot absorbent cotton plant would require an estimated total capital investment of approximately US\$ 390,000, including land, plant and auxiliary equipment.

In return, investors could expect an estimated gross profit margin of 31.6 per cent and a payback period of approximately 25 months, as shown in Table 1.

**Table 1 - Summary of financial projections**

Item	Absorbent cotton plant
Total capital investment (US\$)	390,000
Total revenues / year (US\$)	591,000
Gross profits / year (US\$)	187,000
Gross profit margin	31.6%
Return on investment, annual	48
Investment payback period (months)	25.1

Assumptions: The above calculations assume a market price for absorbent cotton of US\$ 2,767 per tonne (Source: CIRCOT).

Absorbent cotton products are in high demand in Zambia, but are generally imported. For example, Zambia imports all of its sanitary napkins. Many Zambian girls and women can't afford imported sanitary napkins, for which the average price in Zambia in 2016 was ZMW 13 (US\$ 1.26) per packet of eight napkins.<sup>2</sup> Without sanitary napkins, they are often forced to stay home during menstruation, resulting in monthly absences from school or work that constrict their long-term economic outcomes. In addition, taboos and discrimination related to menstruation may undermine their status in the family and community, as well as their self-esteem, exposing them to greater health and social risks.

<sup>1</sup> "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. Tanzanian ginneries export nearly all of their lint, but it is often uneconomical to export short-staple cotton, so ginneries may sell it for other uses, or dispose of it.

<sup>2</sup> Central Statistics Office

The Government can choose to structure this proposed initiative as a commercial venture, producing more affordable sanitary napkins to replace imports. Or it may choose to subsidise the initiative and distribute the napkins for free, for example to schoolgirls, as part of the existing such programme undertaken by the Government in 2017.<sup>3</sup>

As an example of the latter arrangement, from 2011-14, the Kenyan Government commissioned African Cotton Industries, a manufacturer of medical and hygiene products, to produce and distribute disposable sanitary napkins to girls through schools. In 2013-14, the programme delivered napkins to approximately 350,000 girls in Kenya, at an average cost of US\$ 0.38 per packet of eight sanitary napkins (sufficient for one menstrual cycle).<sup>4</sup>

In addition to greater availability of affordable sanitary napkins, this initiative will benefit ginners, who stand to receive a higher price for their short-staple cotton waste. Spinners will also benefit, as the technology can use their comber noil cotton.<sup>5</sup> The manufacturers of absorbent cotton products will benefit from an additional line of business.

More generally, increasing the domestic supply of absorbent cotton products will increase value added in Zambia and replace imports.

### Requirements

Investment:	An up-front total capital investment for the pilot project of approximately US\$ 390,000. Costs to adapt the technologies to the Zambia context. Working capital of US\$ 400-500,000 per year.
Technology:	Importation of the technologies from India or elsewhere, along with their spare parts and specialized maintenance equipment. Licencing of any technical training programmes. Provisions in the licencing agreement, allowing for these technologies to eventually be manufactured in Zambia.
Feedstock:	260 tonnes per year of raw material, either: <ul style="list-style-type: none"> <li>• Short-staple cotton; or</li> <li>• Comber noil cotton</li> </ul>
Capacity-building:	Link the cotton sanitary napkins business to existing menstrual hygiene campaigns, as well as sensitisation campaigns to reduce the stigma that girls and women suffer related to menstruation. Product research to obtain user requirements and specifications for absorbent cotton and sanitary napkins. Training of technicians.
Infrastructure:	As this process would be installed alongside the existing manufacturing operations of Mumbwa Farmers Ginning and Pressing Company, there may not be need for a new facility, although this would need to be assessed.

<sup>3</sup> Lusaka Times, 2016. "Govt praised for its plan to provide free sanitary napkins to rural girls". Lusaka Times, General News, 13 November. Available at: <https://www.lusakatimes.com/2016/11/13/govt-praised-plan-provide-free-sanitary-napkins-rural-girls/>

<sup>4</sup> In 2015, African Cotton Industries, in collaboration with Alliance Gineries Zambia and the German Corporation for International Cooperation (GIZ), proposed to the Government of Zambia to implement a similar programme in the country.

<sup>5</sup> Spinners comb the lint they buy to remove short-staple fibres, before spinning the longer fibres into yarn. The removed fibres are called comber noil.

## Initiative 2: Develop a new value chain for cotton stalks

### Background

Stalks are the main cotton by-product at the farm level. There are currently no commercial applications for cotton stalks in Zambia, as regulations require farmers to destroy their stalks. Nevertheless, in other cotton-producing countries, new technologies have been commercialised to process cotton stalks into final products.

These technologies are often small in scale and relatively affordable, making them suitable for use in rural areas, either directly by farmers or by rural collectives.

If these technologies can be adapted to Zambia, this represents a potential new value chain, creating new jobs and economic activity, as well as a new income stream for farmers.

Based on examples from India, participants recommend that the Government of Zambia import prototypes of the machines necessary to pilot a supply chain to convert cotton stalks into, for example: pellets and briquettes for heating; mushrooms and compost. Lessons from the pilot phase can then inform the design and implementation of a national value chain for cotton stalks.

### Business case

Establishing a pilot cotton stalk supply chain, centred on one briquetting and one pelleting plant, would involve establishing the following activities:

1. Deploying mobile chipping machines throughout the plants' feeder area;
2. Loading and trucking chipped stalks to the plants;
3. Processing the chips into pellets or briquettes;
4. Delivering the pellets and briquettes to end users.

Below is a summary of the investment, financial and marketing components of the business case for a cotton stalk value chain.

Establishing a pilot supply chain for one briquetting and one pelleting plant would require an estimated total capital investment of approximately US\$ 90,000, with the breakdown shown in Table 2.

**Table 2 – Summary of capital requirements**

Item	Quantity	Total installed cost (estimated, US\$)
Briquetting plant	1	65,500
Pelleting plant	1	25,000
<b>Grand total</b>		<b>90,000</b>

Assumptions: The total installed cost of the plants includes the cost of the mobile chipping machines that would supply it with sufficient chipped stalks to operate at full capacity.

Chipped stalks will be transported to the plants by the existing fleet of lorries.

For their investments in a briquetting or pelleting plant, investors could expect a guaranteed supply of chipped stalks, a return on investment of 30-50 per cent and a payback period of approximately 2-3 years, as shown in Table 3.

Table 3 - Summary of financial projections

Item	Briquetting plant	Pelleting plant
Total capital investment (US\$)	69,000	25,000
Total revenues / year (US\$)	350,000	59,000
Gross profits / year (US\$)	35,000	8,000
Gross profit margin	10%	13%
Return on investment, annual	53%	32%
Investment payback period (months)	23	38

Assumptions: The above calculations assume paying farmers an average price for chipped stalks of US\$ 43.25 per tonne and an average logistics cost to deliver the feedstock to the plant of US\$ 23 per tonne (Source: CIRCOT).

The products of these plants would be marketed as fuels to industrial and commercial users. For example, in India, briquettes are used as a substitute for coal in industrial boilers and pellets as a substitute for liquefied petroleum gas (LPG) in commercial boilers and cooking equipment used by restaurants. In Zambia, participants identified breweries and tobacco drying operations as target markets pellets and public institutions for briquettes.

Both cotton stalk-based fuels differentiate themselves on cost from the existing fuels used by users in the target market. In the Indian example, briquettes cost industrial users, on average, 20 per cent less than coal, while pellets sold at a 50 per cent discount to LPG.

Farmers will earn a new income stream by selling their chipped cotton stalks to the pelleting and briquetting plants, priced at US\$ 43.25 per tonne in the Indian example. In addition, the chipping machines and pelleting plant are small in scale and therefore potentially feasible for farmers to operate as a commercial venture through cooperative structures, for example under the umbrella of the Cotton Association of Zambia (CAZ) or the Zambia National Farmers Union (ZNFU). Farmers can also consume pellets themselves, reducing their heating costs.

These products are also a renewable source of energy, replacing dirtier fossil fuels and wood charcoal, as well as reducing the incidence of deforestation for wood fuel. This feature is of policy interest to the Government of Zambia, and of marketing interest to businesses that wish to promote a lower carbon footprint in their supply chains.

### Requirements

Investment:	An up-front total capital investment for the pilot project of approximately US\$ 90,000. Costs to adapt the technologies to the Zambian context. For the briquetting plant, working capital of US\$ 300-350,000 per year. For the pelleting plant, working capital of US\$ 80-100,000 per year.
Technology:	Importation of the technologies from India or elsewhere, along with their spare parts and specialized maintenance equipment. Licencing of any technical training programmes. Provisions in the licencing agreement, allowing for these technologies to eventually be manufactured in Zambia.

Feedstock:	<p>Volume of chipped cotton stalks required during the four-month cotton harvesting season:</p> <p>Briquetting plant: 150,000 tonnes</p> <p>Pelleting plant: 200,000 tonnes</p> <p>For the remaining eight months, identify other suitable biomass feedstock available in sufficient volumes, for example: soybean, maize, sugar cane, etc.</p>
Capacity-building:	<p>Outreach to farmers unions and associations to inform them on the opportunity for them to invest in these technologies for village-level operations.</p> <p>Establishment of effective cooperatives through CAZ or ZNFU, to allow farmers or villages to participate in small-scale activities.</p> <p>Outreach to target customers to obtain their user requirements and specifications for the products.</p> <p>Training of technicians.</p>
Infrastructure:	<p>Adequate roads to accommodate loaded lorries travelling from farm, to processing plant, to market.</p> <p>Trucks and lorries.</p> <p>Warehouse collection points at the village level.</p>

## Multi-stakeholder oversight committee

As a multi-stakeholder committee to oversee the implementation of this plan, including any related activities of the UNCTAD project, participants proposed that the Permanent Secretary of Commerce, Trade and Industry enlist an existing committee under the Cotton Board of Zambia (CBZ), chaired by Stephen Kabwe of the Indaba Agricultural Policy Research Institute (IAPRI). The committee currently consists of CBZ, CAZ, Zambia Cotton Ginners Association (ZCGA) and the Cotton Development Trust (CDT). The participants agreed to add nine additional institutions and organisation as stakeholders in cotton by-products. The following list includes all 13 proposed members - the four existing ones and the nine proposed additions.

1. Indaba Agricultural Policy Research Institute (chair)
2. Cotton Board of Zambia
3. Cotton Association of Zambia
4. Zambia Cotton Ginners Association
5. Cotton Development Trust
6. Ministry of Commerce, Trade and Industry
7. Ministry of Agriculture
8. Zambia Development Agency
9. Crushers and Edible Oil Refiners Association
10. Dairy Association of Zambia
11. Citizens Economic Empowerment Commission
12. Zambia Association of Manufacturers
13. University of Zambia

## Role of UNCTAD

UNCTAD will support the Government of Zambia and the proposed oversight committee in the implementation of the National Action Plan, where the scope and budget of its technical cooperation project permit.

In this context, UNCTAD can support the implementation of the National Action Plan with the following services, for example:

- Secretarial support and drafting of documents for project-related activities;
- Introducing the Government of Zambia to technology owners, for example in India;
- Organising a study tour (Activity 1.4 in the project plan);
- Procuring advisory services (A 2.2);
- Drafting investment profiles (A2.3); and
- Organising a regional workshop among all four project countries (A 2.4).



## Annex 1: Validation of the National Action Plan and Policy Recommendations on Promoting Cotton By-Products in Zambia

Telephone: +260-211-228301/9  
Email: [contrade@zamnet.zm](mailto:contrade@zamnet.zm)  
Fax: +260-211-226673  
Telegrams: COMIND



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REPUBLIC OF ZAMBIA

### MINISTRY OF COMMERCE, TRADE AND INDUSTRY

P.O. BOX 31968  
LUSAKA

29<sup>th</sup> July, 2019

Ms. Yanchun Zhang  
Chief – Commodities Branch  
United Nations Conference on Trade and Development  
**GENEVA**

#### VALIDATION OF THE NATIONAL ACTION PLAN AND POLICY RECOMMENDATIONS ON PROMOTING COTTON BY-PRODUCTS IN ZAMBIA

Reference is made to the above captioned subject and our letter dated 6<sup>th</sup> July, 2018 in which we made comments on the National Action Plan and Policy Recommendations documents that were derived from Zambia's National Workshop.

I wish to acknowledge receipt of the revised National Action Plan and its associated Policy Recommendations. The revised documents have been reviewed, and the Ministry hereby wishes to confirm that the National Action Plan and Policy Recommendations represent the aspirations of the national stakeholders as discussed during the National Workshop.

The Ministry therefore, validates the aforementioned strategy documents, with a minor amendment in the Multi-stakeholder Oversight Committee, to include a few other institutions which were identified as critical to the development of cotton by-products in Zambia in subsequent discussions. The amendment is reflected in the attached National Action Plan.

We thank you for your continued support and look forward to future collaborations with UNCTAD on this and many other issues related to trade and development.

Please accept the assurances of my highest consideration.

Kayula Siame  
Permanent Secretary

**MINISTRY OF COMMERCE, TRADE AND INDUSTRY**