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Mapping and Quantification of the Cotton Chain in Brazil

Industry Speaks

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Abstract

The CHAINPlan method developed by Neves (2007) is a practical tool which can be used to construct strategic plans for production chains. A preliminary step in this process includes mapping and quantifying the production chain. We present the results of applying the method to one of the most important agribusiness chains in Brazil—the cotton sector. The Gross Domestic Product for the cotton sector in the 2010-2011 crop year was estimated at nearly \$19.2 billion. We show the interconnections between the links in the chain and its ability to generate revenues, taxes and jobs.

Keywords: cotton, economic impact, value chain.

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The Cotton Chain

The mapping and quantification of agribusiness chains in Brazil has been the subject of several studies. Readers will better understand the magnitude of economic and social development of the production chain through addressing the following questions:

- How significant is the sum of sales of the various links in the supply chain and its GDP?
- How much tax revenue is generated by the production chain?
- How many jobs are generated in Brazil?
- How significant is the sum of wages paid to workers during a season?

The Gross Domestic Product (GDP) of the cotton sector for the 2010-2011 crop year reached an estimated value of US\$ 19.19 billion (Table 1). Overall financial transactions, which consist of the sum of the revenues of each link in the productive chain sum to US \$37.94 billion.

Table 1. GDP estimate for Brazilian cotton production chain based on final goods

Product	Internal Market	External Market	GDP (IM + EM)
	US\$ (millions)	US\$ (millions)	US\$ (millions)
Cotton lint	Not applicable	745.938	745.938
Cotton linters	113.712	14.004	127.716
Cotton motes	26.512	Not applicable	26.512
Cotton yarns	Not applicable	10.981	10.981
Cotton textiles	11,785.909	164.333	11,950.242
Cotton knits	5,519.544	11.768	5,531.312
Cotton seeds	244.339a	Not applicable	244.339
Cottonseed cake and meal	271.003	Not applicable	271.003
Crude cottonseed oil	228.844b	Not applicable	228.844
Cottonseed-based biodiesel	56.076	Not applicable	56.076
Total	17,772.756	947.024	19,192.963

Source. Elaborated by the authors

a - Sales made by cotton gins considering the total production of cotton seed minus the amount allocated to crushers for the manufacture of cottonseed oil, cake and meal.

b - Sales by crushers, considering the total production of crude cottonseed oil minus the amount destined for the manufacture of biodiesel.

The cotton value chain is divided into three stages: (1) before farm, (2) on the farm, and (3) after the farm.

Before Farms

The link of supplies and inputs includes the resources necessary for agricultural production. Agricultural supply industries accounted for US\$1.93 billion in sales to cotton farmers. Pesticides, fertilizers and fuel and lubricants account for 82% of the sector's expenditure on farm inputs. The high use of pesticides is due to the high incidence of hard-to-control pests and diseases that, if left untreated, can cause major economic losses to growers. The high use of fertilizers is justified mainly by the fact that production is concentrated in the areas of the cerrado

(savannah-like vegetation zones) where the soil conditions require fertilization. The expenditure on fuel and lubricants accounts for the strong use of machinery in all stages of production: planting, treatment, harvest and internal transportation—and by the large number of field applications per harvest year.

On the Farms

In the cotton chain it is common to find an integrated model where growers gin their own cotton. The ginning process therefore is included in on-farm activities. Often, there is a rendering of services among the producers themselves, and in most reported cases, payment is made through the “barter” system, in agricultural enterprises where no ginning occurs on farm. Producers trade a portion of the processed product, mainly cotton seed and lint, for ginning services. Only in the state of Minas Gerais did the interviewees indicate that producers paid cash per kilo ginned. Bartering comprised \$636.41 million of the \$7,059.15 million in revenue earned by cotton farmers. The other \$ 6,423.15 came from the sale of cotton lint.

Beyond the Farm

The next stage in the chain includes the textile industry (spinning and weaving/knitting), which purchases lint from producers. Textiles in 2010 accounted for \$26.38 billion in sales of cotton products (IEMI, 2011; Secex, 2011). Another source of revenue is generated from crushers who process the farm-produced cotton seeds into vegetable oil, meal, and linters. Vegetable oil is marketed primarily to the food and biodiesel industries, while the meal is used for animal feed. The linters, which are short cotton fibers that cover the seeds are also sold by the crushers. The combined sale of oil; cake and meal; linters; and biodiesel resulted in \$737.46 million in revenue.

Value Chain Services

The cotton service sector had sales totaling \$412.12 million. Services include cotton fiber classification laboratories (\$11.10 million); brokerage firms (\$80.96 million); maintenance of gin plants (\$ 21.48); and credit lines for cotton cultivation (\$298.58). Other important service providers such as agricultural consultants and crop application are not accounted for due to the lack of data.

Taxes, Employment and Wages

The cotton sector pays nearly \$8 billion in sales taxes and employs over 150,000 people: 79,477 people working exclusively with cotton and cotton fibers; 14,241 in the cultivation of cotton; 27,481 in the preparation and spinning of cotton fibers; and 37,755 in the weaving of cotton yarn/thread. The total wage bill for the cotton sector in 2010 was \$ 786.79 million.

Product sales estimated in US dollars for the 2010-2011 harvest year can be seen in Figure 1.

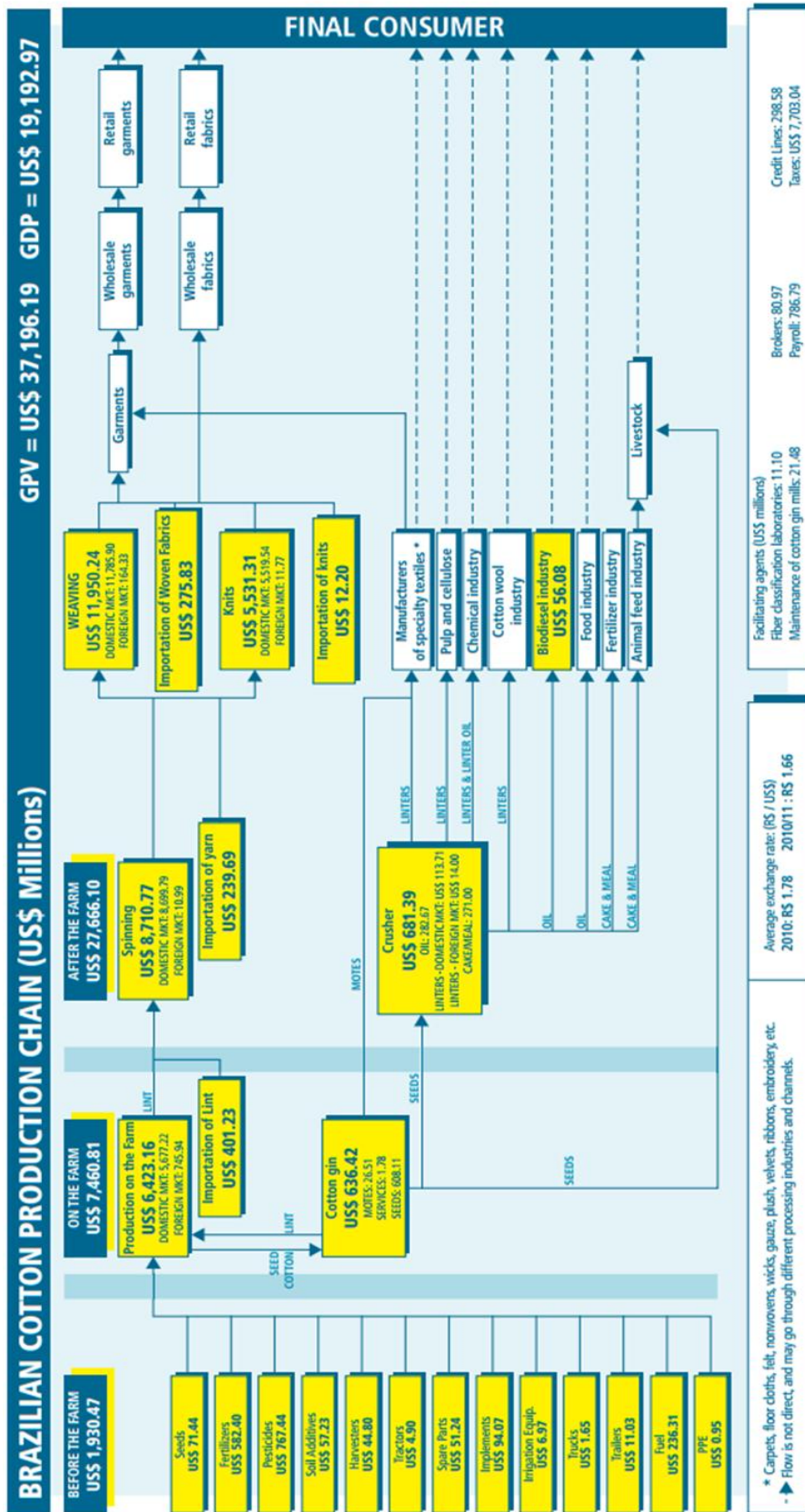


Figure 1. The mapping and quantification of the Brazilian Cotton Chain
Source. Elaborated by the authors.

Conclusion

The cotton chain is very specific, due to the fact that the most important part of the chain doesn't go to the food consumer, but to the textile industry. Consequently, the cotton chain faces competition from the industrial and alternative fiber sectors. The cotton chain is not experiencing the same consumption growth as seen in grains like soybean, corn, wheat, peanuts and others.

The implications of this study provide measurements detailing all aspects of the chain and profit sectors, and the major difficulties the chain currently faces. The findings show the Brazilian cotton sector offers growth opportunities not only in the primary production of lint, but mainly in other production systems, such as food products, pharmaceuticals and textiles, especially when one takes a closer look at the various byproducts generated from raw cotton. Among these products, a recent increase in the value of vegetable oil in the biofuels sector should be highlighted, concomitantly being a natural source of clean energy for the biodiesel industry as well as an important protein concentrate for animal feed, providing 32% crude protein, which directly impacts the development of other production chains, such as cattle breeding.

After examining the numbers and impacts, these type of projects can gain acceptance within Government, private companies and organizations within the cotton chain, and move forward into an implementation phase.

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