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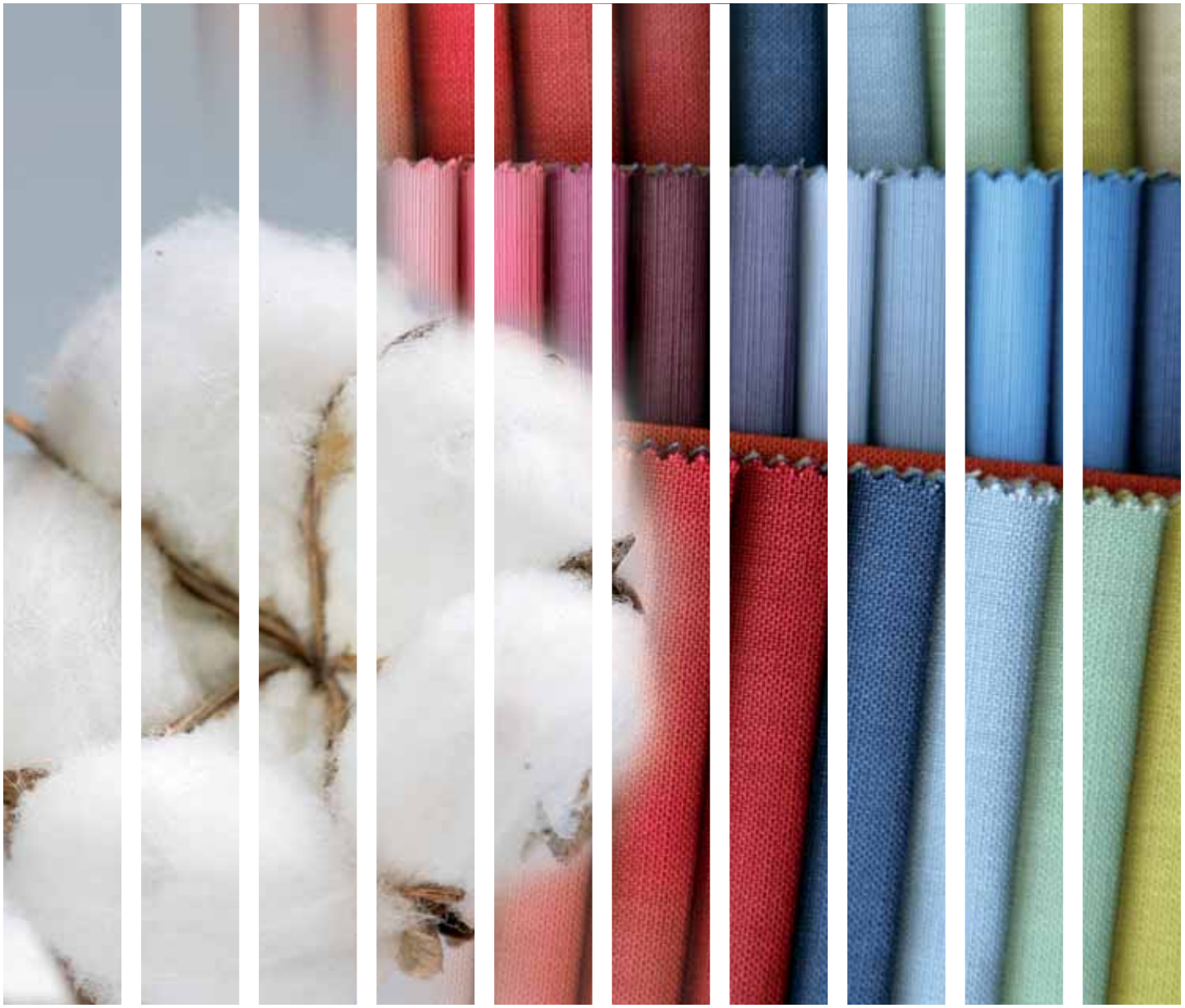
THE 2014 US FARM BILL AND ITS IMPLICATIONS FOR COTTON PRODUCERS IN LOW-INCOME DEVELOPING COUNTRIES



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The United States Farm Bill of 2014 and its Implications for Cotton Producers in Low-income Developing Countries*

*The official name of this bill is the United States Agricultural Act of 2014.

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This report was commissioned by UNCTAD's Special Unit on Commodities. It was written by Dr. Terry Townsend, an independent consultant and a former Executive Director of the International Cotton Advisory Committee (ICAC). It was prepared under the general direction and supervision of Samuel Gayi, Head, Special Unit on Commodities, UNCTAD. Comments on an earlier draft were provided by the following persons from the Special Unit on Commodities, UNCTAD: Janvier Nkurunziza, Chief, Commodity Research and Analysis Section, and Kris Terauds and Yan Zhang, Economic Affairs Officers.

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The United States Farm Bill of 2014 and its Implications for Cotton Producers in Low-income Developing Countries*

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Introduction

Cotton is produced on a commercial scale by about 45 million households in about 80 countries, and provides annual incomes to an estimated 250 million people. For many households, cotton is the sole source of cash income and provides finance for inputs for food production, while also being used as a rotation crop. Because cotton is a storable commodity, and because it can be grown in arid regions, it connects people in interior locations within countries and continents to markets, thus serving as an engine of economic growth.

Accordingly, cotton has always been a commodity of interest to policymakers. From the invention of the cotton gin in the 1790s to the present, the United States has always played a leading role in the world cotton industry because of trade relations with the United Kingdom, the major textile producer from the 1700s to the 1950s, and favourable agronomic conditions. With the exception of disruptions caused by war or extraordinary weather conditions, the United States has almost always been the world's largest cotton exporter, and therefore its policies and programmes have implications for producers in all countries.

United States farm policies have changed substantially since the 1920s. During the Great Depression, the United States Government began trying to boost the incomes of domestic cotton producers by restricting the amount of cotton produced each year and by limiting imports so as to increase cotton prices. It continued to restrict production during the 1970s, and also began to make direct payments to farmers when prices fell below certain thresholds. In the 1980s, realizing that policies to restrict domestic cotton production were resulting in the United States' loss of world market share, the Government abandoned efforts to raise prices by restricting production, and instead began to support farm incomes with direct payments. It also implemented policies to encourage increased mill use and exports. During the 1990s and 2000s, it adjusted the formulas used to determine payments to individual cotton growers to meet budget targets, and some payments were "decoupled" from current production decisions to reduce distortions. Nevertheless, those payments remained significant, accounting for about one third of gross receipts from cotton production, on average.

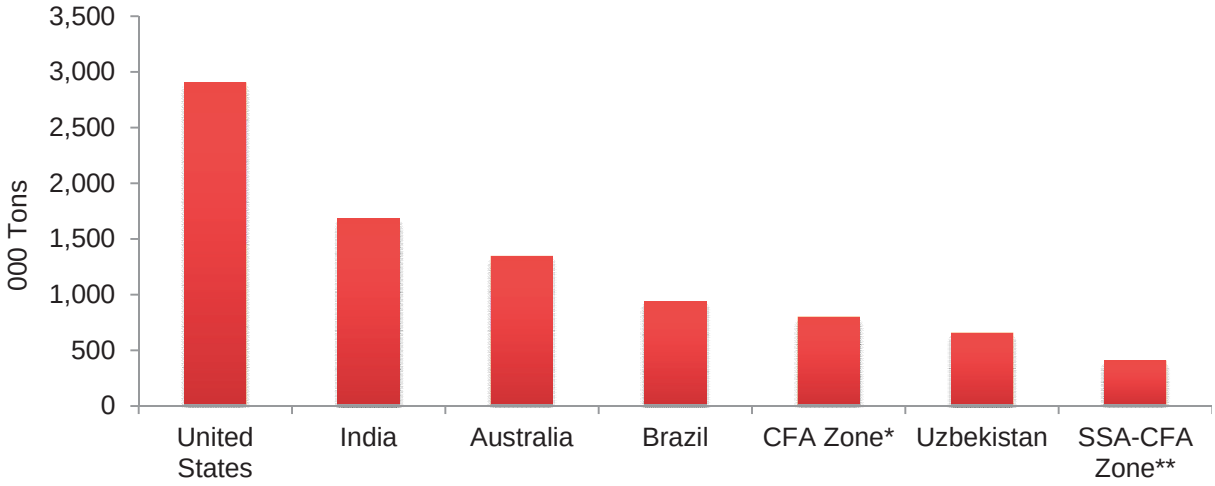
There is widespread agreement that subsidies distort production and trade. Brazil was able to successfully challenge the United States cotton subsidies programme within the dispute settlement mechanism of the World Trade Organization (WTO) by showing that United States cotton exports was causing "serious prejudice" to Brazilian cotton exports. In addition, four African cotton-exporting countries, Benin, Burkina Faso, Chad and Mali (collectively known as the "Cotton 4" or simply, C4), raised the issue of subsidies paid to cotton growers in developed countries at the WTO's Doha Round of negotiations. During the Hong Kong Ministerial in December 2005, members of the WTO agreed to treat cotton expeditiously, ambitiously and specifically within the talks on agriculture. Accordingly, there is much interest worldwide about the evolution of United States cotton policies, which could affect global production, consumption and trade.

Legislation setting the broad parameters of United States agricultural policies covering subsidies, food safety, soil and water conservation measures, and other issues is renewed approximately every five years. The most recent "farm bill", the Agricultural Act of 2014, (H.R. 2642), which was passed by the United States Congress and signed by President Obama in February 2014,will affect the basic structure of agricultural programmes in the United States until 2018. The bill authorizes $956 billion in spending over the 2014 to 2023 period,[1] including $756 billion on food and nutrition programmes, $89.8 billion on crop insurance, $56 billion on conservation programmes, $44.4 billion on commodity programmes, including for cotton, and $9.8 billion on other miscellaneous provisions.

This report aims to provide an analysis of the United States Agricultural Act of 2014 (hereinafter referred to by the commonly used term, the 2014 Farm Bill), focusing on its potential implications for cotton prices worldwide and especially its impacts on cotton producers in low-income developing countries and least developed countries (LDCs). It does not attempt to determine whether the cotton provisions of this Act are compliant with WTO rules or explain the findings of the Brazil cotton case; rather, it seeks to examine whether the subsidies paid to United States cotton growers are likely to lead to increased or decreased United States cotton production by 2018.

The report is divided into six sections. Section 1 discusses the trends in United States cotton production and exports. Section 2 describes the 2014 Farm Bill and Stacked Income Protection Plan (STAX). Section 3 focuses on the outlook for subsidies paid to United States cotton farmers. Section 4 examines long-term trends in the world cotton market and trends in cotton production by major region. Section 5 discusses the opportunities for African cotton producers and highlights some policy recommendations to enhance income from cotton production in Africa. Section 6 concludes.

Figure 1: Major cotton exporters, 2012/13



Note: * Cotton producing countries of Francophone Africa, including Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Cote d'Ivoire, Guinea, Madagascar, Mali, Niger, Senegal and Togo. ** Cotton producing countries of Sub-Saharan Africa other than those in the CFA Zone.

1. Trends in United States cotton production and exports[2]

The breakup of the Soviet Union in the early 1990s resulted in a fundamental demarcation in the structure of world commodity industries, including cotton. Therefore, it is appropriate to use 1990 as the first year in an analysis of the structure of the cotton market.

Over the past 25 years, the United States has produced an annual average of 3.8 million tons of cotton. It has always ranked among the top five producers globally, and has been the largest exporter each season (figure 1).

United States cotton production rose in an impressively strong trend, from 2.4 million tons in 1980/81 to a record 5.2 million tons in 2005/06, but declined steadily thereafter, to 3.8 million tons in 2012/13 and 2.9 million tons in 2013/14 (figure 2). This was partly due to competition from grains and soybeans as a result of mandates to grow crops for biofuel production. With competition from biofuels boosting grain prices, and with cotton yields rising slowly, United States cotton production may continue its downward trend until about 2020.

Cotton production in the United States is gradually consolidating in the south-east (Georgia, North Carolina, Alabama and South Carolina) and Texas. Production in what is referred to as the mid-south (Missouri, Arkansas, Mississippi, Tennessee and Louisiana) is declining, while in the so-called Far West (California and Arizona) it has been about 8 per cent of the country's total for a decade. Higher prices for grain and soybeans in the mid-south, linked to biofuel mandates, have encouraged a shift away from cotton, while water constraints and various alternative crops, ranging from almonds to tomatoes, are gradually exerting greater pressure cotton production in the west (figure 3).

Figure 2: Cotton production, consumption and exports in the United States, 1990/91–2010/2011

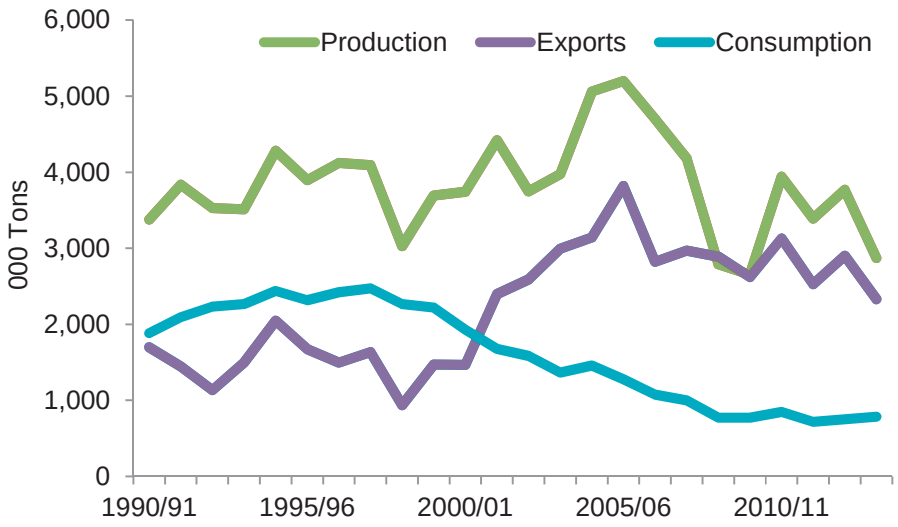


Figure 3: United States cotton production by region, 1990/91–2010/2011

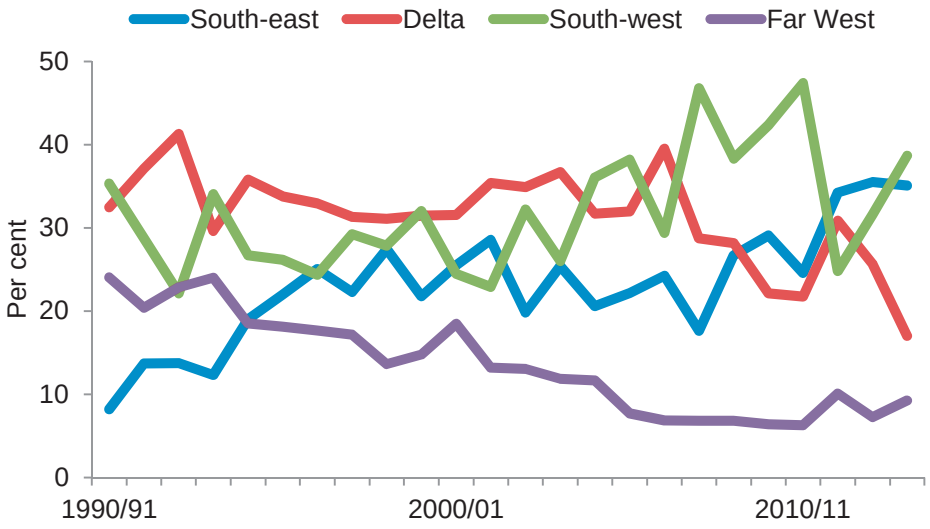
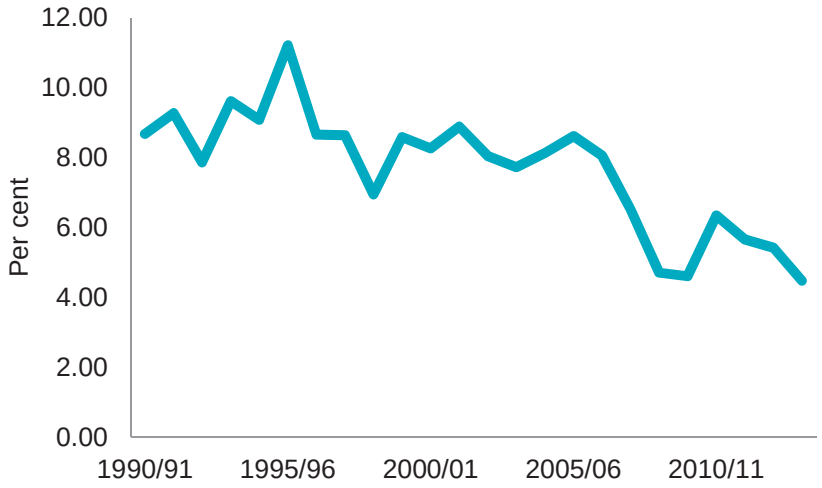


Figure 4: Share of cotton in total area for corn, soybeans and cotton in the United States, 1990/91–2010/2011



The cotton harvested area in the United States fell relative to the harvested area for corn and soybeans between 2005/06 and 2012/13.[3] Between 1990 and 2013, the total area devoted to cotton, corn and soybeans together increased from 55 million hectares to 70 million, but the area under cotton fell during that period. During the 1990s, the share of cotton in the total area devoted to cotton, corn and soybeans ranged between 8 per cent and 10 per cent in most years, and was still only 8.6 per cent in 2005/06. However, between 2005/06 and 2013/14, that share fell by almost half, to 4.5 per cent (figure 4).

The data on harvested area indicate that, from farmers' perspectives, cotton is becoming less attractive than corn and soybeans. Cotton-to-corn and cotton-to-soybean price ratios are declining: between 1990/91 and 2005/06, the ratio of the Cotlook A Index to United States export prices for corn at Gulf Coast ports averaged 13.5:1, and between 2005/06 and 2012/13, that ratio averaged 8.9:1. Likewise for soybeans, the ratio of the Cotlook A Index to export prices for soybeans at United States ports averaged 5.8:1 between 1990/91 through 2005/06, and has fallen to 4.1:1 in the seven seasons since 2005/06.

There are many factors affecting commodity prices, such as population and income growth, macroeconomic variables, consumer tastes and preferences, and changes in technology. However, a major factor causing a sustained increase in prices of corn and soybeans relative to prices of cotton in the United States and on world markets is the increasing use of ethanol for biofuel. The rise in oil prices since 2005 and provisions of the United States Energy Independence and Security Act of 2007 are providing economic incentives for an

expansion of biofuel production in the United States.[4] In 2006, ethanol accounted for less than 4 per cent (by volume) of motor vehicle gasoline supplies in the country, but it grew to 10.6 per cent in 2011. Corn, which is the primary feedstock used to produce ethanol in the United States, is likely to remain so in the coming years. Indeed, it is estimated that 43 per cent of 2013/14 United States corn was used in ethanol production.

The increased demand for corn for use in biofuel production has driven up corn prices, as well as prices of soybeans and other crops that compete with corn as livestock feed. Cottonseed oil is not used to make biofuels because its sugar content is relatively low. Further, cottonseed is a byproduct of cotton production, accounting for just one fifth of the value of seed cotton production.

Therefore, the increase in demand for feed grains resulting from increased biofuel production in the United States is not resulting in a proportionate increase in demand for cotton. Hence, prices of feed grains and oilseeds have been rising relative to the price of cotton since the mid-2000s (figure 5). As long as the United States Government mandates that ethanol be blended into domestic liquid fuel supply, this situation is not likely to change. Consequently, the shift in the relative competitiveness of cotton versus corn and soybeans for land in the United States is likely to persist.

United States cotton exports

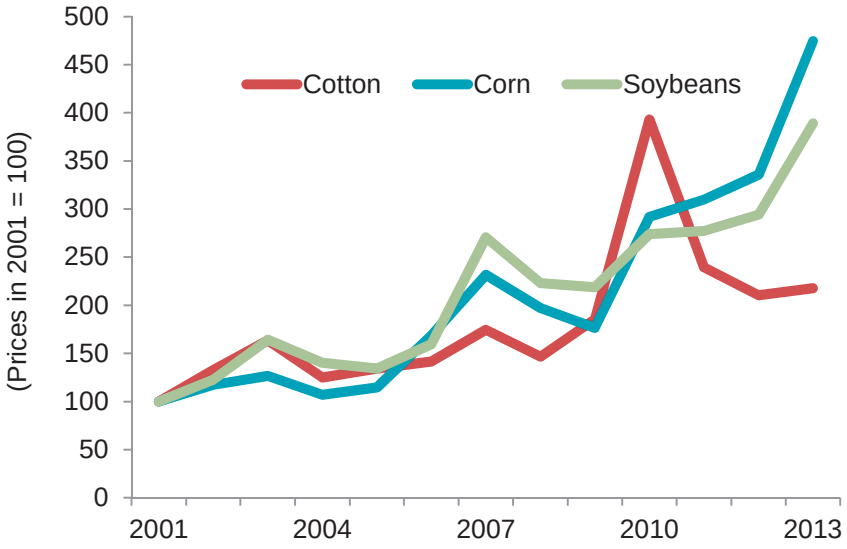
During the past 25 years, United States mill use (consumption of cotton lint by textile mills) has declined from an average of 2.3 million tons during the 1990s to an average of 773,000 tons during the period 2010/11-2012/13. It rose slightly to 784,000 tons in 2013/14, and there could be further moderate increases towards 800,000 tons over the next few years. Nevertheless, cotton production is likely to exceed domestic consumption during the life of the 2014 Farm Bill. Consequently, most of United States cotton production will be exported.

For the past 25 years, the United States has exported, on average, 2.2 million tons of cotton per year, maintaining its role as the largest exporter of this commodity. Cotton exports were 1.5 million tons per year from 1990/91 to 1999/00, 2.8 million tons per year from 2000/01 to 2009/10 and 2.9 million tons from 2010/11 to 2012/13. Exports rose slightly, as production remained high relative to consumption and stock levels fell below 1 million tons. China, Turkey and Mexico were the top three destinations for those exports during this period (table 1). As would be expected, owing to record production in 2005/06, United States cotton exports reached a peak that year, at more than 3.8 million tons. The lowest point for exports, at only 938,000 tons, was in 1998/99, when production declined dramatically due to a severe drought in the United States, while domestic consumption remained relatively high. Indeed, with the fall in exportable surplus, the United States imported a record 96,000 tons.

Table 1: Destinations of United States cotton exports, 2010/11 to 2012/13 (annual average)

	Thousands of Tons
China	1216
Turkey	373
Mexico	231
Indonesia	127
Thailand	97
Rep. of Korea	87
Taiwan Prov. of China	76
Pakistan	65
Japan	29
Hong Kong (China)	14
Rest of the world	559
Total	2874

Figure 5: Price indices of cotton, corn and soybeans, 2001–2013



While changes in stock levels can affect export volumes in any given year, over several years United States cotton exports will equal production minus domestic mill use. If mill use is assumed to be 800,000 tons per year, and production is between 3 million tons and 3.5 million tons, United States exports will probably be between 2.2 and 2.7 million tons per year. Thus, United States cotton exports during the second half of this decade will likely be about one-fifth lower than they were during the first half of the decade.

2. The United States 2014 Farm Bill

Under previous farm acts going back to the 1970s, 1980s and 1990s, cotton farmers and farmers of other "covered commodities" (wheat, feed grains, rice, oilseeds, peanuts and pulses) received three kinds of support from the USDA: (i) marketing loans, (ii) countercyclical payments, and (iii) direct payments. Of these, the countercyclical payments and the direct payments are being eliminated under the new act, but the marketing loan programme will continue. Across all the covered commodities, growers are facing significant programme changes, but in a unique development, cotton is being treated differently. This is most probably in response to the successful challenge of Brazil at the WTO to the treatment of cotton under the previous United States farm acts.

Stacked Income Protection Plan (STAX)

The innovative portion of the new Farm Bill is its increased emphasis on revenue insurance through the Stacked Income Protection Plan (STAX). This Plan will provide revenue insurance to producers of upland cotton.[5] Because of the administrative complexity of the new provisions, and because the bill was enacted after the deadline for implementation of the new provisions for 2014, STAX will not be available until 2015. To provide support in the meantime,, upland cotton producers will receive transition payments for crop year 2014 and also for crop year 2015 in any areas where STAX protection is not yet available. STAX can supplement insurance coverage available through the Federal Crop Insurance programme, or be purchased as stand-alone protection. Federal Government subsidies will cover 80 per cent of producers' premiums. STAX, like traditional crop insurance, is not subject to payment limitations or to adjusted gross income eligibility limits.

STAX is a "shallow loss" insurance programme in which farmers will pay premiums for same-season revenue insurance and will receive indemnities (i.e. payments to compensate for losses covered under insurance policies) when revenue in their county falls below 90 per cent of the "expected revenue" for the current crop year. However, under STAX, indemnities may be no more than 20 per cent of the expected revenue in each county; farmers will have to purchase traditional crop insurance policies to cover greater losses in yields or revenue.

Indemnities will be based on projected prices at planting time and historical yields versus actual prices at harvest and actual yields, as is the case for traditional crop insurance. The projected price will be the ICE (Intercontinental Exchange) cotton futures contract for December delivery during a period defined for each state based on state planting dates; for example, the period for Texas, the largest cotton-producing state, will be from January 15 to February 14 of each year beginning in 2015, and other states will have other periods for determination of expected prices based on their usual and customary planting dates. Actual prices at harvest will also be determined based on the December ICE cotton futures during October in most states.

The revenue estimates are based on countywide calculations.[6] Therefore, under STAX, if revenue in a county falls below 90 per cent of the estimated revenue at planting time, upland cotton farmers in that county who had paid the premiums to buy STAX insurance will receive indemnity payments equal to the difference but no more than 20 per cent of expected revenue. STAX will be available for purchase on all acres planted with upland cotton (see table 2 for examples of how indemnities are calculated under STAX).

Table 2: Example of STAX calculations

	Example A	Example B	Example C	Example D
	Price falls	Price falls	Price rises	Price rises
	Yield falls	Yield rises	Yield falls	Yield rises
Projected price at planting (ICE Futures in January) ($/acre)	$0.80	$0.80	$0.80	$0.80
5-year average yield for the county (lbs/acre)	800	800	800	800
Expected county revenue ($/acre)	$640.00	$640.00	$640.00	$640.00
- 90 per cent of expected revenue ($/acre)	$576.00	$576.00	$576.00	$576.00
- 70 per cent of expected revenue ($/acre)	$448.00	$448.00	$448.00	$448.00
Maximum indemnity in county ($/acre)	$128.00	$128.00	$128.00	$128.00
Harvest price (ICE Futures in October) ($/lbs)	$0.70	$0.70	$0.90	$0.90
Actual county yield (lbs/acre)	600	850	600	850
Actual county revenue ($/acre)	$420.00	$595.00	$540.00	$765.00
Indemnity in county ($/acre)	$128.00	$0.00	$36.00	$0.00
Actual revenue plus indemnity ($/acre)	$548.00	$595.00	$576.00	$765.00

Crucially, STAX will not provide insurance or support against declines in cotton prices from one season to the next. It is essentially a government-operated and subsidized programme to assist cotton producers in hedging their crops for five or six months between planting and harvesting each season. STAX will assist cotton farmers in obtaining finance from commercial banks at planting time. Farmers participating in this programme will be able to pledge to a bank any resulting indemnities as collateral against production loans, and therefore banks will more readily make such loans for cotton production.

The premiums for STAX will be calculated on an actuarially sound basis, which means that over several seasons indemnities will equal premiums. However, the Government will pay 80 per cent of the premiums and will also cover all administrative costs, which will be substantial, given that there are about 15,000 upland cotton farmers in the United States operating about 250,000 separate cotton farms in hundreds of counties, and separate calculations must be made in each county.

Other provisions of the 2014 Farm Bill

In addition to STAX, there are numerous other provisions of the 2014 farm bill that will affect cotton production.

The Risk Management Agency (RMA) of USDA provides a number of crop insurance products that United States farmers may choose, and these insurance programmes will continue under the 2014 Farm Bill. The following is a partial list of traditional crop insurance policies:[7]

- Actual Production History (APH) insures producers against yield losses due to natural causes such as drought, excessive moisture, hail, wind, frost, insects and disease.
- Actual Revenue History (ARH) insurance covers historical revenue instead of historical yields.
- Adjusted Gross Revenue (AGR) and AGR-Lite policies insure revenue of the entire farm, rather than an individual crop, by guaranteeing a percentage of average gross farm revenue, including a small amount of livestock revenue.
- Area Risk Protection Insurance (ARPI) provides coverage based on the experience of an entire area, generally a county.
- Group Risk Income Protection (GRIP) is designed as a risk management tool to insure against widespread loss of revenue from the insured crop in a county.
- Group Risk Income Protection - Harvest Revenue Option (GRIP-HRO) is a supplemental endorsement to the GRIP Basic Provisions.
- Rainfall Index (RI) is based on weather data collected and maintained by the National Oceanic and Atmospheric Administration's Climate Prediction Center.
- Catastrophic Risk Protection Endorsement (CAT Coverage) pays 55 per cent of the price of the commodity established by RMA on crop losses in excess of 50 per cent.

Continued use of marketing loans

All cotton farmers in the United States are eligible to harvest their cotton, store the bales in warehouses, and transfer the electronic warehouse receipts to a local office of the United States Department of Agriculture (USDA). The Government then extends loans to farmers equal to the number of pounds (lbs) of cotton noted in the warehouse receipts multiplied by the loan rate 52 cents/lb) (in May 2014), plus or minus quality premiums and discounts. The warehouse receipts serve as collateral for the loans. Under the new Farm Bill, the national average loan rate can range between 45 cents and 52 cents, depending on a simple two-year moving average of the adjusted world price (AWP).[8] At 2014 price levels, the loan rate will remain at 52 cents.

If market prices are below 52 cents/lb, farmers can keep the 52 cents and forfeit the cotton to the Government, which then auctions the bales used as collateral. Farmers also have the option of repaying the loan at the AWP and capturing the differential as a marketing loan gain. However, if market prices are above the loan rate, farmers have nine months in which to repay the loan - including interest and storage charges - recover control of their cotton and market the cotton through normal commercial channels. Therefore, as long as the average market price for upland cotton received by farmers each season remains above 52 cents/lb, there is no subsidy in the marketing loan programme other than a loan for nine months at what is probably a preferential interest rate, calculated as the cost of borrowing from the United States Treasury plus 1 percentage point. If market prices fall to or below the loan rate, the Government pays interest and storage costs as well as the price differential.

The existence of a loan rate encourages increased cotton production because farmers know with certainty that, even during an economic collapse, they can still "sell" their cotton to the United States Government for 52 cents/lb, falling to 45 cents/lb if the price collapse is sustained. Thus, a range of 45 to 52 cents/lb of lint is an effective floor for prices received by farmers for the base quality of cotton at average location. However, it should be noted that a market price of 45 cents/lb would be well below the cost of production for most farmers, and production in the United States would probably decline substantially if prices fell to such a level.

Short-Term Export Credit Guarantee Program (GSM)

Another programme that will continue under the new Act, but with modifications, is the Short-Term Export Credit Guarantee Program (GSM-102[9]). Under GSM-102, the United States Government does not provide loans, but it guarantees payments by non-United States banks on loans extended by United States exporters (more commonly United States banks) for the financing of domestic agricultural commodity exports to selected destinations.

The duration, or maximum term of the credit guarantees has been reduced from 36 to 24 months, and the new Farm Bill continues the requirement that the fees cover the Program's operating costs and losses over the long

term. Federal budget estimates indicate that this requirement is being met.

The GSM-102 Program is limited to $5.5 billion per year for all commodities. During the four most recent complete fiscal years, 2010-2013, the USDA guaranteed loans for imports of cotton amounting to an average of $275 million per year in exported value, or 7.5 per cent of total GSM-102 activity. At average prices, the GSM-102 guarantees would have covered exports of between 100,000 and 200,000 tons of cotton per year, or about 5 per cent of total United States cotton exports. The largest recipients of GSM-102 guarantees for cotton were Turkey and the Republic of Korea. During the cotton seasons 2010/11 to 2012/13, China was the biggest market for United States cotton exports, averaging 1.2 million tons per season, Turkey was a distant second, averaging 373,000 tons, and Mexico was the third at 231,000 tons per year on average. The Republic of Korea was among the top 10, averaging 87,000 tons per year. Turkey and the Republic of Korea make the greatest use of the GSM-102 Program because banks in each of these countries meet the Program's criteria.

Subsidies to textile mills

The new Farm Bill also maintains the Economic Adjustment Assistance Program for textile mills in the United States using upland cotton. This is a subsidy of 3 cents/lb to those mills on each pound of upland cotton they consume. Assuming annual cotton consumption by textile mills in the United States of 800,000 tons, the annual cost to the Government will be around $50 million.

Treating cotton differently

According to the USDA,[10] STAX is designed to meet United States obligations under the WTO Brazil cotton case. The United States Government argues that STAX will reflect market conditions more rapidly than both previous cotton programmes and the programmes for other United States commodities under the new Farm Bill, because insurance indemnities will be based on current market prices at planting time, instead of a fixed target price of 71 cents/lb as existed under previous farm acts.

For the covered commodities other than cotton, two new programmes have been created: Price Loss Coverage (PLC) and Agriculture Risk Coverage (ARC). Under PLC, producers who have previously grown the covered commodities will receive payments on 85 per cent of their base acres on a commodity-by-commodity basis when market prices fall below a reference price for each crop. This is essentially the same as the countercyclical payments in the previous farm acts. ARC is a revenue insurance programme, under which payments will be provided to producers of covered commodities on a commodity-by-commodity basis on 85 per cent of base acres when county crop revenue (actual average county yield multiplied by the national average farm price) drops below 86 per cent of the county benchmark revenue. Producers may make a one-time choice to enroll in one of these two programmes for the life of the new Act. Upland cotton producers are not eligible for PLC or ARC, as they are covered by STAX.

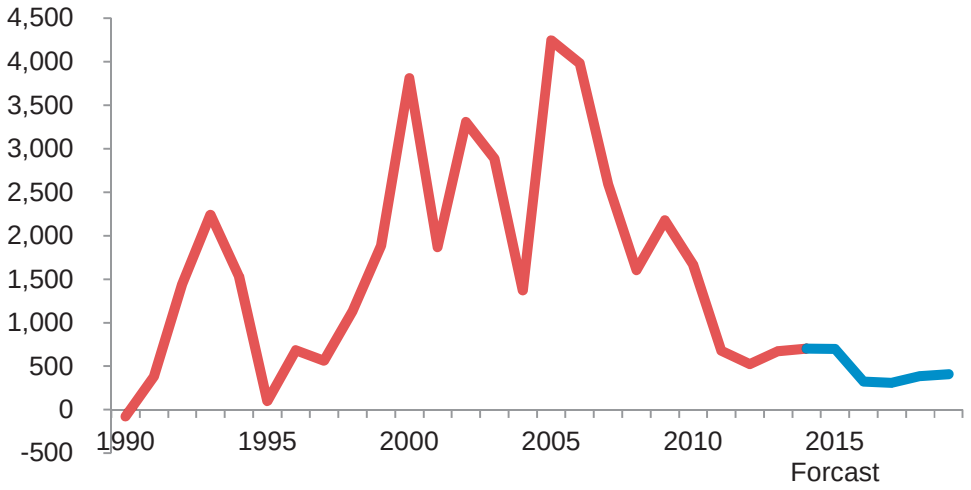
In addition to STAX, producers of all covered commodities, including upland cotton, will have a second revenue insurance option, the Supplemental Coverage Option (SCO). SCO will supplement traditional crop insurance and will provide coverage based on county average yields or revenue. The United States Government will subsidize 65 per cent of the premiums. Like traditional crop insurance, SCO will not be subject to payment limitations or adjusted gross income eligibility limits. SCO coverage will not be available to producers who elect to participate in STAX. Since the subsidy offered under STAX will be greater than 65 per cent, most analysts assume that upland cotton producers will elect to participate in STAX instead of SCO. However, although SCO is not receiving much attention, it deserves to be mentioned because it is an option that will be available.

3. Subsidies paid to United States cotton farmers

The impacts of STAX on cotton production in the United States can be anticipated, but they are hard for economists to quantify, because the programme is a drastic change from previous programmes and because STAX will not even be operational until 2015, so that there is no set of historical data to study. Nevertheless, even with the 80-percent subsidy of the premiums offered under STAX, government outlays for upland cotton, as estimated by the Congressional Budget Office (CBO), will be lower than levels under the repealed Direct Payments and Counter-cyclical Payments (DCPs). This suggests that the incentives to produce cotton in the United States will be weaker than they were during previous decades. Accordingly, competing cotton-exporting countries, including developing countries and LDCs, will have greater opportunities, other things being equal, than they would have had if the 2014 Farm Bill had continued providing support as before.

During the eight fiscal years from end-September 2003 through September 2008, corresponding to the 2002 Farm Bill, average expenditures on direct and countercyclical payments to upland cotton were $2.8 billion per year. During the six fiscal years from end-September 2009 through September 2014, corresponding to the provisions of the 2008 farm bill, expenditures on upland cotton are estimated to have averaged $1.1 billion per year. Based on USDA estimates of average farm prices and production during the life of the 2014 Farm Bill, the Congressional Budget Office estimates that outlays under STAX for upland cotton will average about $360 million per year. Thus, expenditures under STAX are estimated at about one eighth of the cotton subsidies paid under the 2002 Farm Bill and about one third of the subsidies paid under the 2008 Farm Bill. However, STAX subsidies will be of the same magnitude as subsidies paid in the early 1990s (figure 6).

Figure 6: United States Government expenditures on upland cotton (millions of dollars)



The "baseline" of United States cotton production estimated by the USDA that was used by the Congressional Budget Office for the projections above, assumes a harvested area of 3.4 million hectares per year and production of 3.1 million tons per year. Accordingly, the premium subsidies under STAX in the 2014 Farm Bill will amount to about $100 per hectare, or about 5 cents/lb of production. To put this in perspective, a farmer could achieve the same degree of price protection (but not yield protection) by purchasing a put on the December cotton contract at a strike price 10 per cent out of the money[11]. In mid-April 2014 (many farmers plant in April), the December futures contract was trading at about 82 cents, and a 74-cent put (the right to sell at 74 cents) cost a little less than 2 cents/lb.

In comparison, United States Government outlays for upland cotton averaged $525 per hectare or 28 cents/lb. of production during fiscal years 2001-2008, and outlays are estimated to be an average of $325 per hectare and 16 cents/lb of production between fiscal years 2009 and 2014. Therefore, upland cotton will be receiving much less under the 2014 Farm Bill than was received under the two previous farm bills. This suggests that United States cotton production is more likely to remain constant or decline in the years ahead, rather than increase, and therefore its share of world cotton exports is likely to follow a downward trend as well.

A major difference between STAX and the previous cotton subsidy programme is that there is no fixed price level guaranteed by the Government under STAX, other than the loan rate. Under the old cotton subsidy programme, farmers knew that the Government would always make up the difference if prices fell below the target price of 71 cents/lb. However, under STAX, if market prices trend lower, the expected revenue in each county on which STAX indemnities will be calculated will also decline, and could fall as low as the loan rate. This suggests that, over time, STAX will provide insurance against within-year declines in revenue between planting and harvest times, but it will not arrest a downward trend. Thus, under the 2014 Farm Bill, the marketing loan rate will be the only price floor for cotton farmers, and even that rate could decline to 45 cents/lb if market prices move low enough. If market prices decline even lower than 45 cents/lb of lint equivalent at average location in the United States, analogous to a Cotlook A Index of approximately 57cents/lb, United States cotton farmers would again benefit from the price support provided by the Government, which would place farmers in other countries at a disadvantage.

Since 1990, the season average Cotlook A Index has been below 57 cents/lb. three times: in 1999/00, it was 53 cents, in 2001/02, 42 cents, and in 2004/05, 52 cents.[12] As detailed elsewhere, market prices have been supported by purchases by the Government of China for the State Reserve since 2011/12, and if the Reserve's buying activity stops abruptly, a decline in market prices to less than 57 cents is highly likely. Thus, while the 2014 Farm Bill provides less support to cotton than did previous farm bills, it nevertheless still provides support. In years of very low market prices, such as those in which the A Index is below 57 cents/lb., United States farmers will still produce cotton as if the A Index were 57 cents. However, since the countercyclical payments that were contained in previous farm bills have been eliminated in the 2014 Farm Bill, domestic cotton production would likely fall sharply at these price levels, since costs of production for most farmers are substantially higher.

A second major difference between the 2014 Farm Bill and all previous ones is that cotton is now being treated "differently." Under this latest Act, each of the other programme commodities has a "reference price" set by statute. If average farm prices fall below those reference prices, farmers electing to participate in the Price Loss Coverage (PLC) Program will receive payments to make up the difference on 85 per cent of their base acres. Farmers participating in the Agricultural Risk Coverage (ARC) Program will receive payments on 85 per cent of their base acres if revenue falls below the ARC guarantee, which is 86 per cent of the benchmark revenue. The prices used to calculate benchmark revenue may be no lower than the reference prices. Therefore, 73 per cent of the reference prices (85 per cent of base acres times 86 per cent of benchmark revenue) will effectively be the floors for prices received by farmers for the covered commodities other than upland cotton (table 3).

Table 3: Effective floor prices under the 2014 and 2008 Farm Bills

	Target Price	Effective Price Floor	Reference Price	Effective Price Floor	Loan Rate	Effective Price Floor
	2008 Farm Bill	2008 Farm Bill	2014 Farm Bill	2014 Farm Bill	2014 Farm Bill	Ratio of 2014 over 2008 farm bills
		85% of base acres		85% of base acres		
				86% of ARC Guarantee		
Wheat $/bushel	$4,17	$3,54	$5.50	$4.02		1.13
Corn $/bushel	$2,63	$2,23	$3.70	$2.70		1.21
Soybeans$/bushel	$6,00	$5,10	$8.40	$6.14		1.20
Cotton $/bushel	$0,71	$0,60			$0,5200	0.86

Table 4: Cotton/corn and cotton/soybean price ratios

	Corn	Soybean	Ratio	Ratio	Ctlk A* Index	Ctlk A* Index
			Cotton/ corn	Cotton/ beans	Needed for parity with corn	Needed for parity with soybeans
Reference price ($/ton)	146	309				
Payments on 85 per cent of base acres ($/ton)	124	262				
Export-farm price basis ($/ton)	29	72				
Reference prices at port ($/ton)	153	334	10.9	4.6	0.75	0.70
ARC guarantee (per cent)					0.86	0.86
Equivalent A Index ($/lb)					0.65	0.60
Export-farm price basis for cotton (Cents/lb.)					0.12	0.12
Equivalent farm price ($/lb)					0.53	0.48

* Ctlk A refers to Cotlook A.

For cotton in the United States, the most important competing crops are corn and soybeans; the reference price for corn is set at $146 per metric ton (market year average farm price of $3.70 per bushel) and for soybeans at $309 per ton (market year average farm price of $8.40 per bushel).

During the decade of the 2000s, the ratio of the Cotlook A index to export prices for corn at Gulf Coast ports in the United States averaged 10.9:1, and the ratio of the Cotlook A Index to soybean prices positioned for export at United States ports averaged 4.6:1. The usual basis between the Cotlook A Index (an indicator of the average price of cotton delivered to East Asian ports) and the United States market year average farm price is about 12 cents/lb; the average basis between export prices and farm prices is $29 per ton for corn and $72 per ton for soybeans (table 4).

Therefore, to maintain the historic relationships between prices of cotton and those of corn and soybeans in the United States, given reference prices of $146 per ton for corn and $309 per ton for soybeans, the Cotlook A Index will have to be between 60 and 65 cents/lb, which converts closely to the national average loan rate for cotton of 45 to 52 cents/lb.

Accordingly, even though cotton is being treated "differently" in the 2014 Farm Bill through a different programme called STAX, rather than PLC or ARC, the level of support given to cotton prices will be similar to that given to prices of other covered commodities, as long as the cotton loan rate remains at 52 cents; if the cotton loan rates drops to 45 cents, the support given to cotton will be less than that given to other commodities. What these calculations indicate is that support for all the covered crops in the United States is being substantially reduced under the Farm Bill of 2014.

Cotton production in the United States showed an upward trend between 1990/91 and 2005/06, climbing from 3.4 million tons to 5.2 million tons, but it declined to 2.8 million tons between 2005/06 and 2013/14. During 2009/10 to 2012/13, after the market disturbances caused by the Great Recession, it has averaged 3.5 million tons, about the same as in 1990/91. However, that level has been sustained by above-average prices. During the sixteen seasons from 1990/91 to 2005/06, when production was rising, the Cotlook A Index averaged 65 cents/lb, whereas during the most recent four seasons when production averaged 3.5 million tons, the Cotlook A Index will have averaged approximately $1.10/lb. If, and when, the Cotlook A Index returns to the long-running average of 73 cents/lb, and with indemnities to United States farmers under STAX hedging against only within-season declines in prices but not supporting prices received from one season to the next, United States cotton production may decline towards 3 million tons per year or less.

Support to cotton provided by other countries

According to the ICAC,[13] the Governments of Burkina Faso, China, Colombia, Côte d'Ivoire, Greece, Mali, Senegal, Spain and Turkey all provided about the same or more support per pound of production in 2012/13 as United States farmers will receive under STAX (table 5).

Table 5: Subsidies paid to cotton producers by selected countries, 2012/13

	Production (Thousands of tons)	Average support (Cents/lb)	Total Support ($ million)
China	7 300	36	5 813
United States	3 770	7	562
Turkey	550	26	312
Greece	251	47	262
Spain	57	70	87
Burkina Faso	260	14	80
Mali	189	12	50
Colombia	21	49	22
Côte d'Ivoire	140	5	14
Senegal	13	4	6

It is clear that the level of support provided by China to its cotton sector dwarfs the levels provided by other countries, although the assistance provided per pound of cotton production in 2012/13 was greater in Spain, Colombia and Greece than in China. China provides support to its cotton sector by maintaining a minimum price for procurement of seed cotton from farmers that is substantially above market levels. As a consequence, China has been accumulating a surplus for three seasons, and has been supporting market prices to the advantage of all exporting countries during these seasons. Other countries, including Brazil and India, also operate price or income support programmes for cotton in some years, but market prices were above the programme thresholds for intervention during 2012/13 in these other countries.

Even though the levels of assistance to cotton production may have been lower than in previous seasons in all countries except China, and even though the levels of assistance may have been compliant with WTO obligations for most countries, it is still worth emphasizing that all subsidies distort production and trade to the disadvantage of countries that do not provide such subsidies.

4. Long-run trends in the world cotton market

Despite prices well above the long-term average, world cotton production fell during both 2012/13 and 2013/14, and production in 2013/14 at 25.7 million tons is no higher than it was eight seasons earlier (figure 7). The world cotton industry is going through an era of stagnation in production, similar to the situation that prevailed from the mid-1980s to the end of the 1990s. As was the case from the mid-1980s to about 1999/00, and as has been occurring again since 2007/08, world cotton yields are not rising because no new fundamental breakthroughs in production technology have been commercialized since biotechnology-induced improvements in 1996.

Figure 7: World cotton production and consumption, 1990/91–2010/11 (millions of tons)

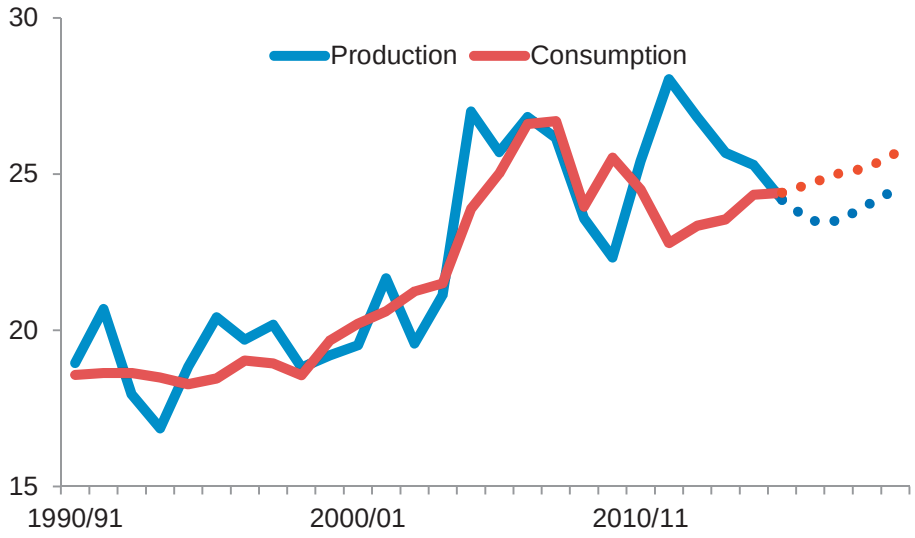
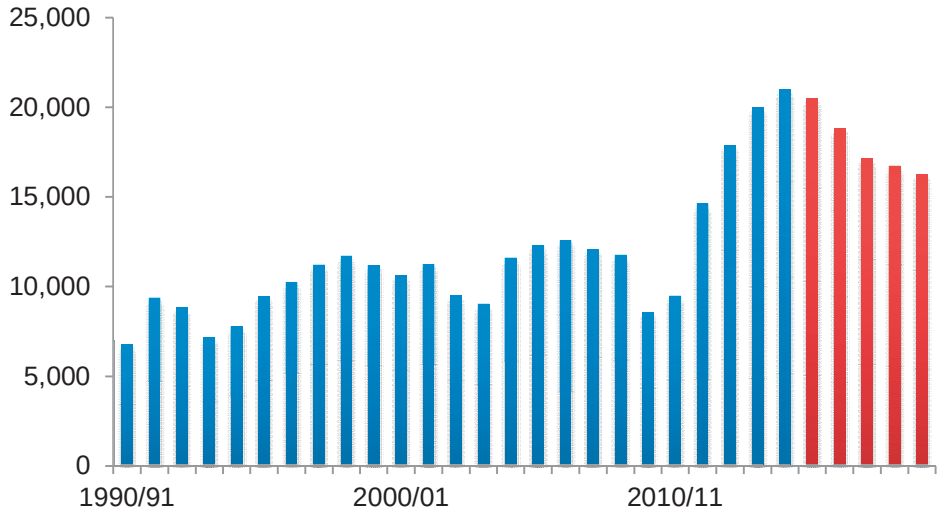


Figure 8: World cotton, ending stocks, 1990/91–2010/11 (thousands of tons)



China has supported the world cotton market for the past three seasons by purchasing cotton for a state reserve. These purchases have kept cotton prices well above the long-term average and 20 to 30 cents/lb above the price of polyester.

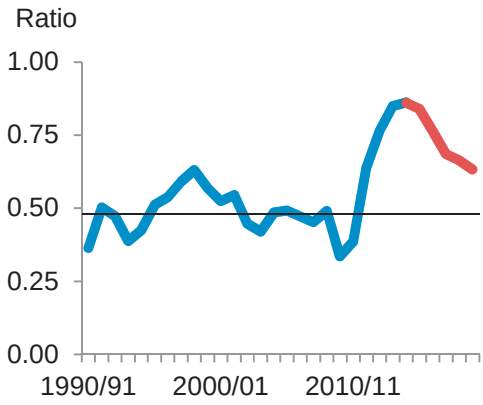
China began its current program of building a state reserve of cotton in March 2011, after the highly damaging experience of extreme price volatility during 2010/11. During the 2011/12, 2012/13 and 2013/14 seasons, China has built a reserve that is estimated to total about 12 million tons, and this reserve represents more than half of all world cotton stocks (figure 8). Because this reserve is being kept away from the market, there is no way for textile mills to use it. Consequently, prices of cotton outside the reserve have been maintained at levels well above the long run average of 73 cents/lb. The Cotlook A Index is estimated to average 91 cents/lb during 2013/14 by ICAC.

When China ceases its cotton purchases for the State Reserve, cotton prices will decline. Whether the decline is precipitous and steep or gradual and shallow will depend on the timing and nature of changes in China's stock-holding policy. In January 2014, the Government of China announced that it would begin to experiment with direct payments to farmers in Xinjiang in order to support incomes without distorting market prices. The procurement system is still being used in the eastern part of the country during 2014, and the Government has not yet indicated whether the system of direct payments will be extended to all of China in 2015.

History indicates that world stocks equal to six months of world use at the end of the international cotton season on 31 July result in stable prices. Six months of use of stock at the end of July each season provides enough inventory for textile mills to wait during August, September and October for a new crop of cotton from the northern hemisphere to begin moving from farms to gins and warehouses, one to two months more for arrival at mills and another month of working inventory. If stocks represent less than six months of use, prices tend to rise as mills and merchants scramble to cover needs, and if stocks represent more than six months of use, prices tend to decline as producers try to shift the costs of insurance, storage and interest (approximately 0.60 cents/lb per month at current interest rates) in carrying the excess.

World ending stocks are estimated at 10 months of use for the 2013/14 and 2014/15 seasons (figure 9), and mill-delivered polyester prices in China are just 65 cents/lb as of May 2014, suggesting that the Cotlook A Index could fall well below the long-term average of 73 cents/lb when support from China ceases. As of mid-May 2014, the July 2014 ICE cotton contract was approximately 90 cents per pound, while the December 2014 contract was about 82 cents/lb, indicating that market participants anticipate changes in China's cotton buying policies during 2014/15.

Figure 9: World cotton: Ratio of ending stocks/use, 1990/91–2010/11

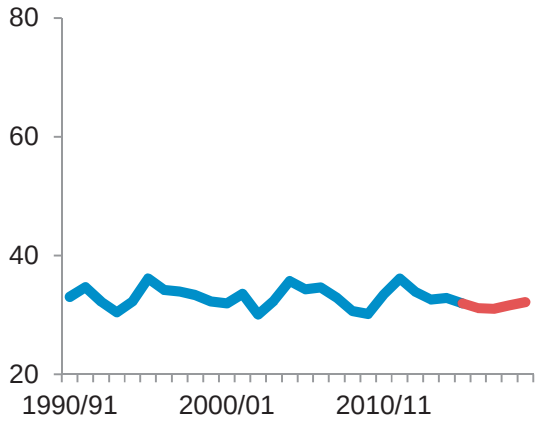


Accordingly, it must be acknowledged that any opportunity for expanded production and exports by developing countries and LDCs during the next several years will be in an environment of softening prices compared with recent years.

World production stagnant

World cotton production essentially quadrupled from 7 million tons in 1950/51 to 27 million tons in 2004/05, and then amidst much price volatility, it climbed to a record high of 28 million tons in 2011/12. The average annual rate of growth in world production over the last six decades has been 2.5 per cent, or about 290,000 tons. However, during 2012/13 and 2013/14, world production declined because of lower cotton prices, both in absolute terms and relative to the prices of competing crops. The world cotton-growing area fell from 36 million hectares in 2011/12 to 33.8 million in 2012/13, and then to 33.1 million in 2013/14 (figure 10).

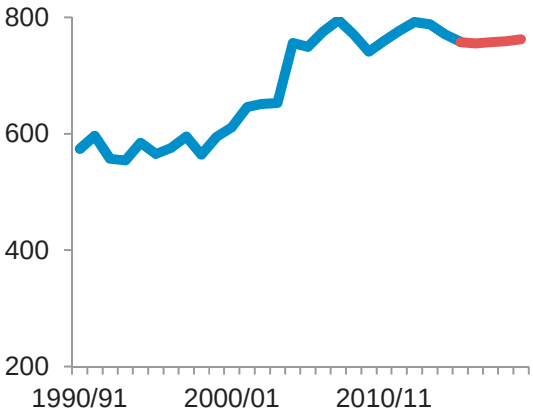
Figure 10: World cotton-growing area, 1990/91–2010/11 (millions of hectares)



The total area in the world dedicated to growing cotton has fluctuated between 28 million hectares and 36 million hectares since the 1950s, with an average of 33 million hectares. While there have been dramatic reductions in cotton-growing areas in some regions since the 1950s, particularly in the United States, Central Asia, northern Brazil and North Africa, there have been offsetting increases in francophone Africa, China, India and Pakistan. Therefore, at 33.1 million hectares in 2013/14, the total world area for cotton was exactly equal to the long-run average. The troubling aspect for the cotton industry is that the Cotlook A Index averaged $1/lb in 2011/12 and was still 88 cents/lb in 2012/13, well above the 40-year average of 73 cents/lb, and still the world area for cotton fell to just the average level in 2013/14. This suggests that if, or when, cotton prices regress to their historic mean, the world area for cotton will trend below the average level maintained since the 1950s.

Since the 1950s, all the growth in world cotton production was due to improved yields. World cotton yield has trended higher since the 1950s, with periods of slow growth alternating with periods of rapid growth. In the early 1950s yields were around 230 kilograms of lint per hectare, rising steadily at an average annual rate of more than 2 per cent during the 1950s and 1960s, and then more slowly from the mid-1970s until the mid-1980s. During the 1980s, world cotton yield rose dramatically, reaching a record high of nearly 600 kilograms per hectare in 1991/92. However, yields stagnated during the 1990s due to problems associated with diseases, resistance to insecticides and disruption of production in Central Asia. They then began rising again in the late 1990s with improvements in seed varieties and the use of biotech (genetically engineered) varieties, attaining a record 795 kilograms per hectare in 2007/08, and a similar level in 2012/13. However, yields are estimated to have declined to about 780 kilograms per hectare in 2013/14, the sixth consecutive year in which world cotton yields have not risen (figure 11).

Figure 11: World cotton yields, 1990/91–2010/11 (kilograms of lint per hectare)



The reason world cotton yields are not increasing is because there has been no further technological breakthrough in recent years to fundamentally boost yields to a new level. Beginning with Mendelian breeding in the early 1900s, mechanization after the Second World War, the development of synthetic fertilizers in the 1960s, pesticides in the 1970s and 1980s, and then biotechnology in the 1990s and 2000s, agricultural productivity has risen in a stair step fashion with the development of each new technology. There are many new technologies under development that will boost cotton productivity later this decade and during the 2020s, including biotechnology applications that will provide increased efficiency of nitrogen use, drought tolerance, salt tolerance, and resistance to a wider spectrum of insects, but those technologies are five to ten years away from commercial release.

With yields flat, at least for the rest of this decade, and with the world area for cotton under growing pressure from competition with grains and oilseeds, world cotton production is not likely to rise substantially from its current level of between 25 and 30 million tons per year. As a consequence, almost all the gain in world fibre use is accruing to polyester, not cotton.

Population and income growth are the primary drivers of world fibre use, and the relative price of cotton to polyester is the biggest determinant of changes in cotton's share of fibre use. According to the International Monetary Fund (IMF), world economic output is expected to increase by 3.7 per cent in 2014 and by 4.1 per cent annually by 2018.[14] Similarly, the Organization for Economic Co-operation and Development (OECD), forecasts that world economic output will grow, but at a slower pace, with annual growth averaging 3.1 per cent in the period 2014-2019 and 2.4 per cent during 2020-

2025.[15] Additionally, the United Nations Department of Economic and Social Affairs (UN DESA) forecasts that the world's population will grow to 8.08 billion by 2025 from 7.16 billion in 2013.[16] Given that both population and economic activity are increasing, the average annual world fibre consumption is expected to increase at around 6 per cent during the rest of the current decade.

Unfortunately for the cotton industry and for the millions of families engaged in cotton production, the prices of polyester in major consumer markets are much lower than the prices of cotton. By mid-May 2014, in round numbers the Cotlook A Index was more than 90 cents/lb, while mill-delivered prices of polyester in major Asian markets were about 65 cents/lb. It is the fourth consecutive year that cotton prices have been higher than polyester prices, and the result is a predictable loss of market share. Consequently, even though fibre use is rising, world cotton use has fallen every season since its peak of 27 million tons in 2007/08. World trade in cotton is estimated at 8 million tons in 2014/15, compared with 8.6 million tons in 2013/14 and 9.7 million in 2012/13. Imports by China are expected to fall from approximately 3 million tons this season to 2 million tons in 2014/15, and are expected to be even lower in 2015/16 as purchases for the State Reserve are reduced and more domestic cotton is used in Chinese mills.

Regional production trends

China

After rocketing to 6.3 million tons in 1984/85, cotton production in China fluctuated to between 3.5 million tons and 5.7 million tons for nearly two decades; and production in 2003/04 was still just 5.5 million tons. It then soared, just as it had in the early 1980s, as the area under cotton expanded significantly in the Xinjiang Autonomous Region. Production in 2004/05 was 7.1 million tons, rising to 8.1 million tons in 2007/08. However, just as suddenly as production had risen, it again declined, to 7.3 million tons in 2012/13 and 6.7 million tons in 2013/14. Thus, Chinese production in 2013/14 was only 6 per cent higher than it had been 30 years earlier (figure 12).

There has been an extraordinary shift in the location of cotton production within China. In 1984/85, when national production exceeded 6 million tons for the first time, the provinces of Hebei, Shandong, Hubei and Henan along the Yellow River and Yangtze River accounted for 4.25 million tons, and Xinjiang produced just 190,000 tons.

However, by 2012/13, the same four eastern provinces accounted for just 2 million tons of the total, while Xinjiang produced 3.5 million tons.[17] Production in Xinjiang reached 4.4 million tons on 2.3 million hectares in 2012/13, and for 2013/14 it is estimated at 4.3 million tons on 2.2 million hectares.[18] Yields there are much higher than the world average and the United States average because of good irrigation, low pest pressure, and ideal temperature and soil types. Indeed, Xinjiang accounted for more than half of total Chinese cotton production for the first time in 2012/13. Moreover, due to competition with food crops and urbanization leading to reduced area for cotton in the east of the country, the long-run tendency will be for cotton production in China to be consolidated in Xinjiang (figure 13). However, because of water constraints, production in Xinjiang is expected to remain at about its current level. Consequently, by 2020, total production in China may be down to about 5 million tons.

Figure 12: China: Cotton production, 1990/91–2010/11 (millions of tons)

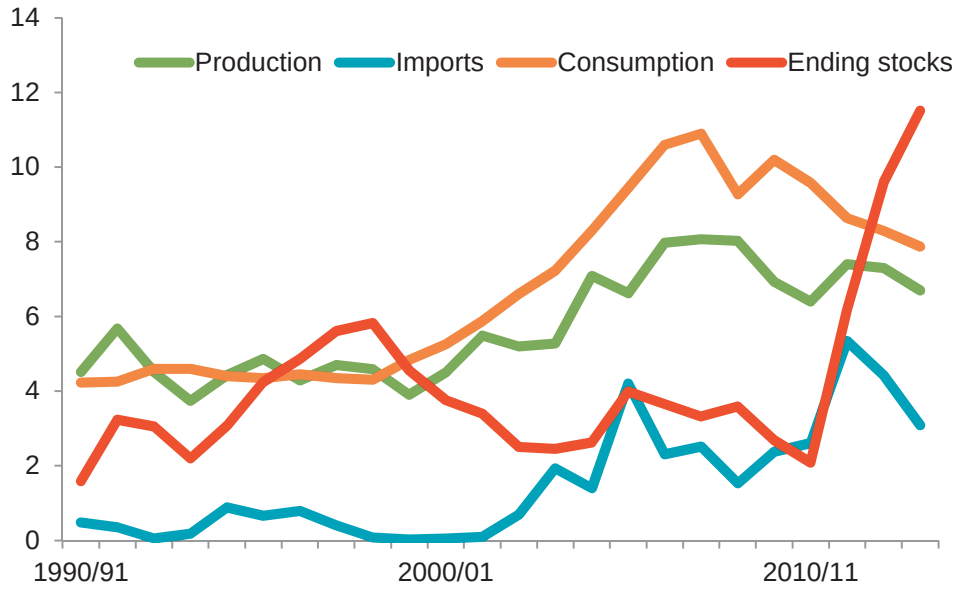
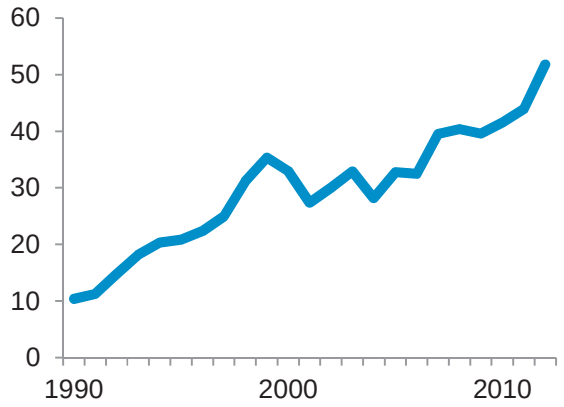


Figure 13: Share of Xinjiang in China's total cotton production, 1990–2010 (per cent)



India

Cotton production in India rose from 1.3 million tons in 1980/81 to 2.3 million tons in 2002/03, and again increased nearly threefold to a record 6.4 million tons in 2011/12, but it fell slightly to 6.1 million tons in 2012/13 and is estimated at 6.3 million tons in 2013/14 (figure 14).

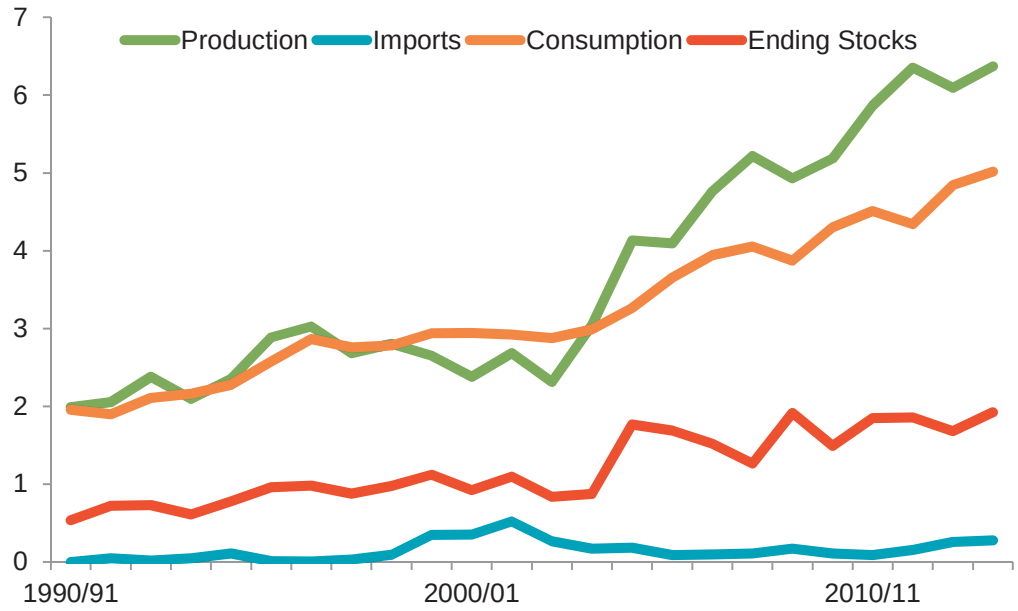
The increases in Indian production have been relatively uniform across the three major cotton-producing regions of the country. In 2002/03, when national production was just 2.3 million tons, the northern states (Punjab, Haryana and Rajasthan) accounted for 16 per cent of the total, and by 2012/13 when the national total was 6.1 million tons, the north still accounted for 15 per cent. The central states (Gujarat, Madhya Pradesh and Maharashtra) accounted for 55 per cent of production in 2002/03 and 58 per cent more recently. The southern states (Andhra Pradesh, Karnataka and Tamil Nadu) produced 20 per cent of the Indian total in 2002/03 and 27 per cent in 2012/13. The more uniform increase in production across regions in India compared with China reflects more uniform agronomic characteristics across India without the development of millions of hectares of irrigated area, as in Xinjiang.

Both China and India represent triumphs for biotechnology in developing countries. Since their adoption in China in the late 1990s and in India in 2002, biotech cotton varieties contributed significantly to higher yields and production, increases in farmers' incomes and reduced insecticide use. However, as in other countries, the benefits of biotechnology have now been incorporated into Chinese and India production practices, and there is little further scope for immediate yield gains. Indian production is expected to grow slowly this decade, reaching about 7 million tons by 2020.

Pakistan

Cotton production in Pakistan expanded from 700,000 tons in 1980/81 to 2.2 million tons in 1991/92, but has not grown since, and is estimated at 2.1 million tons in 2013/14. Production is limited by temperatures as high as 50° C, the leaf curl virus and, in some years, water shortages. The temperature and virus-related stresses limit the range of varieties that may be grown in the country, and breeders have not been able to produce higher yielding varieties in more than 20 years.

Figure 14: India: Cotton production, 1990/91–2010/11 (millions of tons)



Brazil and South America

While the potential for cotton production in Brazil is almost limitless, in reality it may have reached its peak. Production rose from 300,000 tons in the mid-1990s to 2 million tons by 2010/11, but since then it has declined, to 1.3 million tons in 2012/13 and an estimated 1.6 million tons in 2013/14. As in many parts of the United States, grain and soybean prices dictate the extent of area to be devoted to cotton production in Brazil. Given that there is no water constraint in the states where cotton is grown, Brazilian producers use cotton as a rotation crop to boost soybean yields; cotton is not the primary crop for most producers.

In Brazilian cotton history, 2013/14 is already infamous as the year a new bollworm species, *Helicoverpa armigera*, was detected. The Brazilian cotton association, ABRAPA, estimates that the yield losses and insecticide applications associated with this pest alone amounted to $1 billion in costs to producers that year. The new pest is only controlled by extensive applications of insecticides: up to 10 kilograms of active ingredient per hectare compared with a world norm of 1 kilogram. If effective means of biological control of all forms of bollworm are not developed, cotton production in Brazil will decline.

Production in the rest of South America was 240,000 tons in 2012/13 and 380,000 tons in 2013/14, with Argentina accounting for more than half of this total. Difficulties in developing regional strategies to control the boll weevil, a pest found only in the Western Hemisphere, are limiting growth potential among smallholders throughout South America. Only in Argentina and Brazil, where large capital-intensive agricultural operations are able to manage the boll weevil on a large scale, are there opportunities for expanded cotton production.

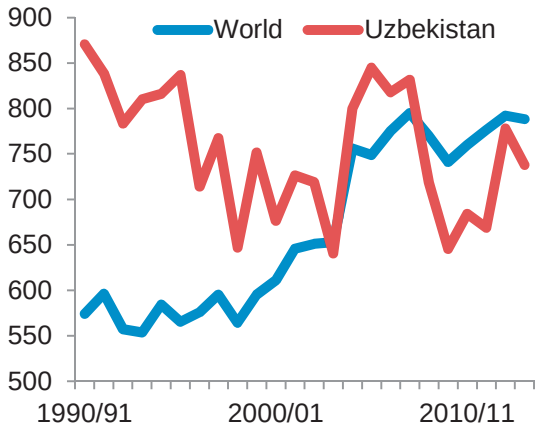
Uzbekistan and Central Asia

Production in Uzbekistan dropped from 1.5 million tons in the early 1990s to 1 million tons by 2000, and it has remained at about that level ever since. With a managed economy in which the area devoted to cotton is determined nationally and all area is irrigated, production varies little from year-to-year based mostly on fluctuations in temperatures. Production estimates were 1 million tons for 2012/13 and 920,000 tons for 2013/14. Figure 15 compares world cotton yields to the yields in Uzbekistan.

The most notable aspect of the 2012/13 and 2013/14 seasons in Uzbekistan was the elimination of both children's work and child labour in cotton harvesting, following the Government's steps to ensure that only adults were involved in the entire cotton harvests.[19]

Central Asian cotton production is trending downwards because of an emphasis on food production and declines in yields. In the 1980s, yields in Central Asia were double the world average at about 800 kilograms per hectare. Today, cotton yields across Central Asia are about 100 kilograms per hectare less than the world average, and no change in that trend is likely. Yields are stagnant or falling in this region because there have been few improvements in varieties since the break-up of the Soviet Union, and degradation of soil is continuing because of wasteful water use.

Figure 15: Cotton yields: World and Uzbekistan, 1990/91–2010/11 (kilograms per hectare)



Production in Turkmenistan was 335,000 tons in 2012/13 and 330,000 in 2013/14, and production in Tajikistan was 130,000 tons and 120,000 tons in those two years.

Turkey

Production in Turkey has been more volatile than in any of the other major cotton-producing countries in recent years. It climbed from 500,000 tons in the early 1980s to about 900,000 tons in the early 2000s, and then plummeted to less than 500,000 tons in 2009/10. The following year it doubled to 950,000 tons, but has once again been sinking, to 860,000 tons in 2012/13 and 840,000 in 2013/14. Competing crop prices and changes in subsidies provided to the cotton sector underlie this volatility.

Australia

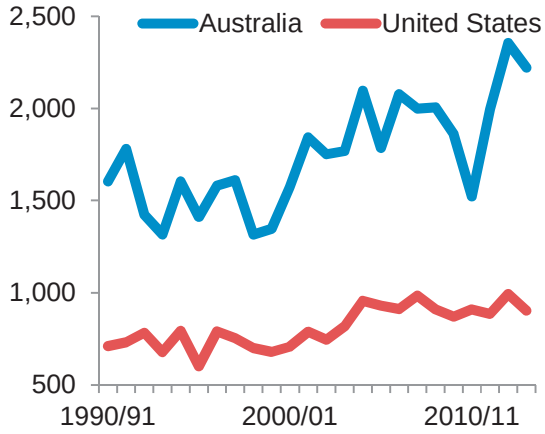
In Australia, the pattern is the same as in Turkey, but for different reasons. Australian production rose from 100,000 tons to 800,000 during the 1980s and 1990s, but has been on a roller coaster since, depending on water availability. Australian production dropped to 130,000 tons in 2007/08 because of drought, and then leapt to a record 1.2 million tons in 2011/12. Since then, it has been falling steadily, to 1 million tons in 2012/13 and 930,000 tons in 2013/14. With Australian yields per hectare already the highest in the world, at 2.2 tons per hectare, and area limited by water availability, there is little scope for increased cotton production. Likewise in Turkey, with yields already above 1.5 tons per hectare, and the land devoted to cotton limited by pressure from competing crops, prospects for an increase in production are weak .

The high yields in Australia are noteworthy because they are partly the result of government policies. Besides the fact that almost all cotton is irrigated, agronomic conditions are excellent and Australian production technology is the best in the world, Australian farmers receive no subsidies. In the United States and other countries where subsidies are provided, the value of subsidies is capitalized into land values, thus driving up

costs and discouraging other capital investments. In addition, subsidies keep marginal farmers in operation on their farms longer than would otherwise be the case, thus slowing technology adoption and undermining production efficiency. Moreover, subsidies provide incentives to farmers and their representatives to spend time and effort in rent-seeking activities (lobbying government for more subsidies) instead of focusing on productivity enhancement.

During the first five seasons of the 1990s, yields in Australia averaged 1,546 kgs/ha compared with 740 kgs/ha in the United States (i.e. a difference of 806 kilograms). During 2008/09 through 2012/13, yields in Australia rose to 1,991 kilograms, on average, compared with United States yields, which rose to 913 kilograms, on average (i.e. a difference of 1,078 kilograms). Thus, not only are Australian yields higher than those of the United States, they are also rising faster (figure 16).

Figure 16: Cotton yields: Australia and the United States, 1990/91–2010/11 (kilograms per hectare)



Africa

Like South America, Africa could be an area where cotton production could increase this decade, and yet, like South America, huge potential is not a guarantee of huge achievement. Africa has abundant unused arable land, and because cotton is a relatively high-value crop, drought tolerant and storable, expansion in cultivation of various crops may include cotton.

Cotton production in North Africa shrank from 670,000 tons in the early 1980s to 120,000 tons in 2013/14. Production in Egypt was fully controlled by the State until the mid-1990s, and as liberalization has proceeded and farmers have been allowed to choose their cropping patterns based on prices and resource availability, production has fallen. Similarly in the Sudan, the Government has progressively relaxed controls over farmers' choices, and cotton production has declined against competition from food crops. North African production was 120,000 tons in both 2012/13 and 2013/14.

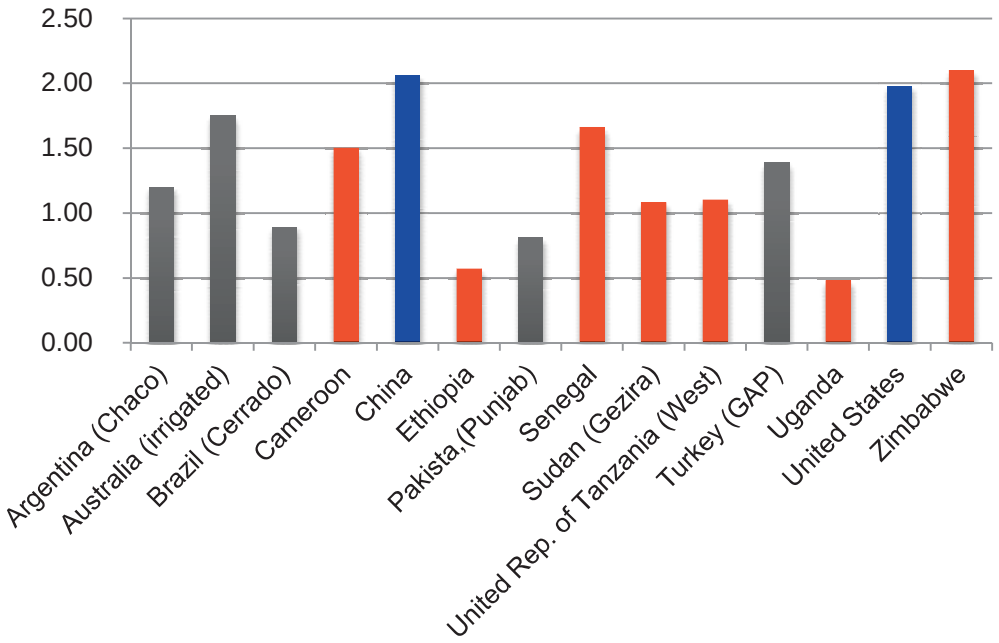
Production in West Africa, including the Franc Zone, reached 1 million tons in 2004/05, dropped to less than 500,000 tons in 2010/11, and partially recovered to 850,000 tons in 2011/12 and 825,000 in 2012/13. Political uncertainty in Mali and Côte d'Ivoire, difficulties controlling side-selling or pirate buying, and ineffective systems to supply inputs to growers in some countries have undermined long-term efforts to expand production. On the other hand, the agronomic characteristics of the region are highly favourable for cotton, and, with improvements in input supply, production could expand.

Production in Eastern and Southern Africa is estimated at 390,000 tons in 2012/13 and 530,000 tons in 2013/14. The incentives and constraints governing cotton production in these subregions are similar to those in West Africa.. Low yields, but abundant land and adequate rain, and difficulties providing inputs and controlling side-selling/pirate-buying remain the main factors influencing the levels of production in these subregions.

For many African countries, cotton is strategically important for generating export revenue, creating employment and reducing poverty. As shown in figure 17, cotton producers in many African countries are more competitive than their counterparts in developed countries. However, because of price-distorting subsidies, they are disadvantaged in the international market. The C4 (i.e. Benin, Burkina Faso, Chad and Mali) raised the issue of cotton subsidies in the WTO, and called for the complete phase-out of support measures in developed countries' cotton production and exports.

The next section explores the main opportunities for African cotton producers to increase cotton production and improve value addition.

Figure 17: Cost of cotton production in selected countries, 2013 (dollars per kilogram of lint)



Note: Cotton in Australia is either dry land or irrigated. In other countries, production varies by geographic region, not water source.

5. Opportunities for African cotton producers

Over the 40 years between 1973/74 and 2012/13, the Cotlook A Index averaged 73 cents/lb. The average Index during the current season will be about 92 cents/lb, and any realistic appraisal of market opportunities must acknowledge that the current level of cotton prices cannot be maintained. As the State Reserve in China is gradually reduced over the next several years, there is a strong likelihood that international cotton prices will decline. Nevertheless, prices lower than the current above-average levels can still be remunerative if the costs of production are below the level of prices received. The costs of production per kilogram of lint in many African countries are below the world average, and they are below average costs in the United States and China (figure 17). This indicates that even if the Cotlook A Index declines towards the long-run average over the next several years, African producers will still earn positive margins from cotton production.

In addition, biofuel mandates in developed countries, combined with world income and population growth and the resulting pressures on food prices, will probably keep prices of grains and oilseeds above the average levels that prevailed prior to the mid-2000s. Consequently, the area devoted to cotton in Brazil, China, Turkey, the United States and other countries is more likely to fall rather than rise during the remainder of this decade. Accordingly, there will be competitive space in the world cotton market for expanded production and exports from developing countries and LDCs. Because sub-Saharan Africa accounts for just 6 per cent of world cotton production, expanded production in Africa will not exert significant downward pressure on world cotton prices to levels lower than they would be anyway.

Further, agricultural technology is in a phase of consolidation so that no major breakthrough is likely during the rest of this decade. This will give African producers an opportunity to close the gap between the world and African yields. Meanwhile across Africa, incomes are rising, better governance is apparent, and countries are welcoming private sector initiatives. To take advantage of these opportunities to increase cotton production African governments need to design and implement reforms in two key areas: increasing supplies of and access to inputs, and improving regulation of the sector.

Input availability

The African cotton value chain has many objectives for growth and development within its three segments: production, marketing, and value added in the form of textile and apparel production. The Pan-African Cotton Road Map, approved in May 2012, was developed under the auspices of UNCTAD through a collaborative and inclusive process that involved all major actors in the cotton value chain. This road map builds on existing regional cotton development strategies and provides a comprehensive set of recommendations for industry improvement, and efforts towards its full implementation should continue.

While all three segments of the cotton value chain - production, marketing and value added - are important and can contribute to employment creation, income generation and export earnings, it is self-evident that production is the foundation on which the other segments are based. Agriculture employs millions, while the marketing and value added sectors employ

thousands. Accordingly, a near-term emphasis on increased cotton production will facilitate more growth in the African cotton sector than an emphasis on either marketing or textile production. This is not to suggest that the cotton marketing and the value added sectors should be ignored, but simply that enhanced production is the shortest route to increased incomes for the largest number of people.

The biggest constraint on increased cotton production is the failure to provide inputs to farmers. Accordingly, in order to take advantage of the market opportunities available in the next five years, African governments need to improve systems of input delivery to farmers.

Between 1990/91 and 2013/14, the world cotton lint yield rose by an average of 12 kilograms per hectare per year, increasing from roughly 575 kilograms to 775 kilograms. During the same time, the yield in Southern and Eastern Africa showed no trend growth, rising and falling around an average of 250 kilograms per hectare, and the yield in the CFA zone actually fell by an average of 4 kilograms per hectare per year, from 450 kilograms to 375 kilograms (figure 18).

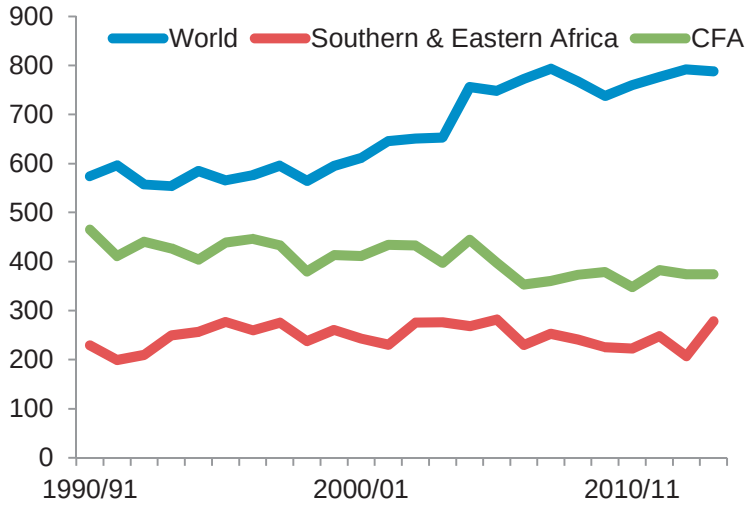
Agriculture is complex, and there are many reasons for poor performance. The major factors that affect yields are technology, technology extension to growers, logistics covering the purchase, transportation and ginning of seed cotton, and input use.

Technology: African countries have been producing cotton commercially for nearly a century, and many African scientists are highly trained and meet international levels of competence. African research facilities are underfunded, as they are everywhere, but facilities have been receiving support for a decade from Australia, Brazil, China, the European Union, India, Pakistan, the United States and other countries under the WTO's Cotton Initiative. Other countries that have been supporting agricultural research in Africa for decades are France, Germany and the United Kingdom. African countries have been active participants in regional technical meetings on cotton, including those organized under the auspices of the Southern and Eastern African Cotton Federation (SEACF), the African Cotton Producers' Association (Association des Producteurs de Coton Africains - AproCA), and the World Cotton Research Conferences (WCRC). African farmers have access to the latest technology developments, and Africa's scientists have the expertise to adapt and apply these developments within appropriate packages for adoption, in particular because, as mentioned earlier, African technology development is receiving support. This support should continue.

Technology extension: The extension of technology to farmers is a challenge everywhere, including in Africa where there are an estimated 3.5 million cotton-producing households, many of whom are illiterate. In addition, they are physically isolated in rural areas without good roads or electricity, and sometimes gender roles inhibit interaction with researchers and extension agents. Nevertheless, African farmers have been producing cotton for decades, and there are substantial cumulative impacts of multiple training initiatives, both public and private sector, funded at national, bilateral and multinational levels, with NGO contributions and farmer participation through village associations, subnational regional organizations and national organizations of farmers. Ongoing efforts in Africa to provide more and better training, with new training techniques that are also gender-appropriate, should also continue.

Logistics: Once seed cotton is harvested and transported to a procurement centre, it has to be weighed and loaded, transported to a gin, ginned, baled and warehoused. The cotton seed must be stored and transported to users, and the lint moved to a port or mill and delivered to customers, and farmers need to be paid. Often, African roads are bad, railroads do not function, ports are congested, and gins often have to provide their own electricity, which means importing diesel to power the generators that power the gins. Farmers have to be paid in cash in most countries because rural banks are non-existent. Seed cotton grading systems are simplistic, and do not provide incentives matched to market preferences for lint quality.

Figure 18: Cotton yields: World, Southern and Eastern Africa and CFA, 1990/91–2010/11 (kilograms of lint per hectare)



Any observer can cite a litany of shortcomings, but for all the inefficiencies, high costs and other shortcomings, companies in Africa can procure, gin, transport and store cotton and pay farmers. Companies have been producing and handling cotton and cotton seed for decades, and every bale of cotton produced eventually moves to market. Poor logistics contribute to lower prices paid to farmers than would be the case in more highly developed economies, but improving logistics requires decades of economic development, not years, whereas the incomes of African farmers could be increased more, and more quickly, if there was a greater emphasis on input availability.

Input availability: The primary reason that yields are low across Africa is because input availability is suboptimal. Many inputs are used in cotton production, including seeds, soil, water, sunlight, fertilizer, pesticides and labour. Nitrogen use per hectare is a barometer of overall input utilization. The agronomic requirements of cotton vary with soil type, temperature and rainfall, but, on average, one hectare of cotton requires about 125 kgs of nitrogen.

The ICAC has been surveying cotton production practices at three-year intervals for several decades. The most recent report was completed in 2012 based on data from 2011.[20] Of the major countries reporting, average nitrogen use per hectare was 200 kilograms in Australia, 180 kilograms in Brazil, 150 kilograms in Egypt, the Islamic Republic of Iran and Pakistan, 125 kilograms in Kazakhstan and 115 kilograms in the United States. In contrast, average nitrogen use was between 30 and 50 kilograms per hectare in Burkina Faso, Cameroon, Mali, the United Republic of Tanzania, Zambia and Zimbabwe (figure 19). Clearly, nitrogen applications and, by implication, all purchased input applications are suboptimal across sub-Saharan Africa. And, while technology, extension and logistics could all be improved, it is input availability that is the prime constraint on increasing yields and production in Africa.

Regulation

Beginning in the 1980s and continuing through the 1990s and 2000s, single-channel monopoly commodity production and marketing boards have been disbanded across Africa. Some of the cotton boards were notoriously inefficient and corrupt, and were wisely disbanded; others were efficient and well managed, and should have been kept. Regardless, there is a need to move forward. A lesson of the past two decades, which even the most ardent advocate of deregulation would have to acknowledge, is that a highly regulated cotton sector in which input supply to farmers is linked with seed cotton procurement results in better outcomes than an unregulated sector.

Cameroon is an example. Producing an average of more than 500 kilograms per hectare, it has the highest national yield in sub-Saharan Africa, other than South Africa (which has produced only 10,000 tons of cotton in recent years). Cameroon has maintained its single-channel national cotton company, Société de Développement du Coton du Cameroun (SODECOTON), and has been able to continue to supply inputs to growers at recommended rates in order to maintain production levels. In comparison, in neighbouring Chad and Nigeria, where agronomic conditions are identical to those in Cameroon but where the national cotton sectors are less well regulated and supported, national cotton yields are about 200 kilograms per hectare - less than half the yield in Cameroon (figure 20).

Figure 19: Nitrogen use in cotton production (kilograms per hectare)

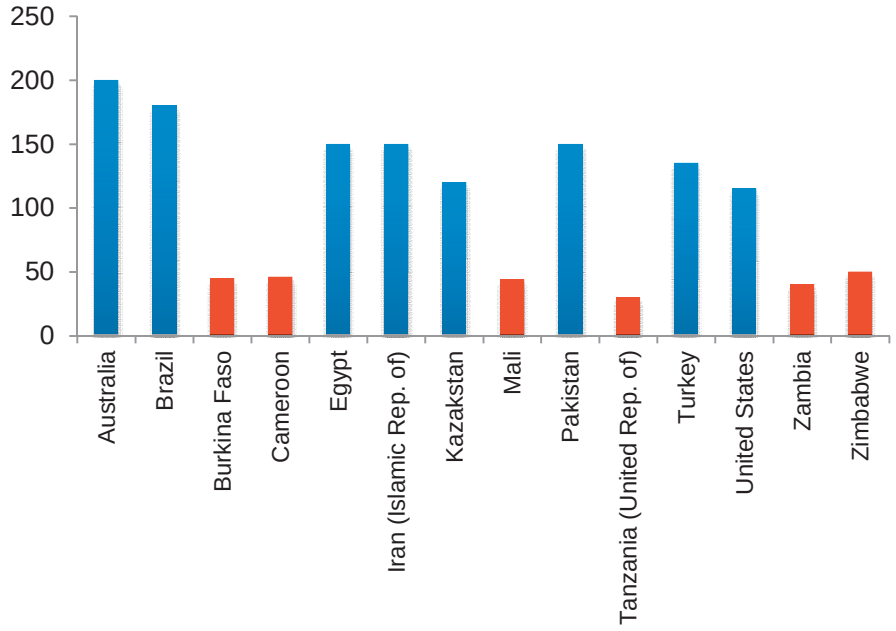
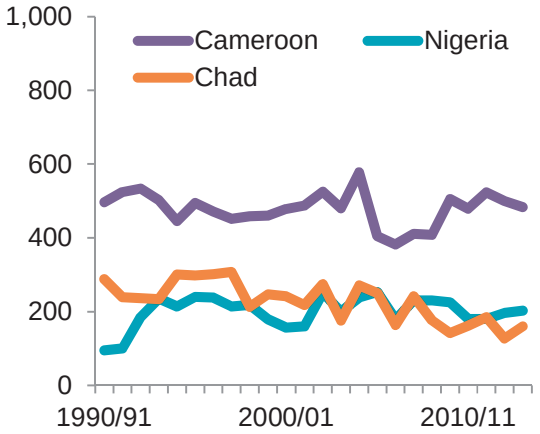


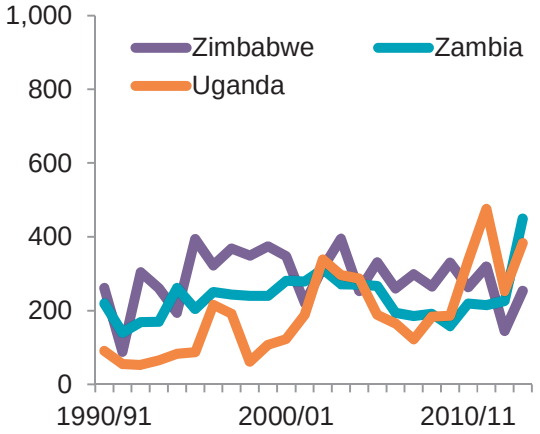
Figure 20: Cotton yields in Cameroon, Chad and Nigeria, 1990/91–2010/11 (kg of lint/hectare)



During the three most recent cotton seasons, 2011/12 to 2013/14, the harvested area in the CFA zone averaged 2.3 million hectares and production averaged 860,000 tons, with an average yield of 375 kilograms of lint per hectare. If the yield across the region had risen to the level of Cameroon at 535 kilograms per hectare, total production on the same area could have been 1.2 million tons.

Likewise, Uganda and Zimbabwe serve as examples in Southern and Eastern Africa. While the cotton zones of these two countries are separated by about 3,000 kilometers, the agronomic conditions in each region are similar. However, their regulatory histories and governance situations are very different. Yields in Uganda were the lowest in the world in the 1980s, but have been trending upwards and are now among the highest in the region. In contrast, yields in Zimbabwe have been trending downwards since the mid-1990s (figure 21).

Figure 21: Cotton yields in Zimbabwe, Zambia and Uganda, 1990/91–2010/11 (kg of lint/hectare)



Uganda created the Cotton Development Organization (CDO) in the 1990s to regulate the sector, gather statistics and ensure quality standards. Zimbabwe has moved in the opposite direction, disbanding its Lint Marketing Board and relying on the private sector to self-regulate.

The cotton industry formed the Cotton Ginners Association of Zimbabwe in an effort to maintain quality standards, and it required that all ginners contribute to the provision of input packages to growers, but not all ginners have joined or agreed to conform to industry standards.

During the three most recent cotton seasons, the harvested area in Southern and Eastern Africa averaged 2.1 million hectares, and production averaged 520,000 tons with an average yield of 245 kilograms of lint per hectare. If the yield across the region had risen to the level of Uganda at 380 kilograms, production on the same area could have been 800,000 tons.

If yields across sub-Saharan Africa had risen to the levels achieved in Cameroon and Uganda - yields already being achieved by other farmers on the continent using African technology packages under African conditions - the increases in production would be worth about $1 billion, or about $300 per year per cotton-growing household.

Governance structures in the cotton sector of Africa have been studied in great depth.[21] Different countries have different cultural, historical and political experiences, and any solutions must be tailored to local situations. Nevertheless, there is now overwhelming empirical evidence that a successful cotton sector requires extensive regulation. Whether that regulation is accomplished through national associations with the approval of the government, or through government regulatory bodies or national monopolies, could be determined in each country. But, the evidence is clear: regulation is needed to ensure the provision of inputs to growers and the procurement of seed cotton by ginners. Accordingly, in order to take advantage of the competitive opportunities that will be available to producers in developing countries over the next five years, it is recommended that African governments establish and enforce the regulatory frameworks used in countries with the highest yields, namely Cameroon and Uganda.

Within the context of the Pan-African Cotton Road Map, Productivity, Actions II (Agricultural inputs and seeds) and III (Soil protection/conservation and fertility of agricultural lands) offer the greatest opportunities for near-term gains in productivity, production and income.[22]

Other priorities

While production is the foundation on which the cotton value chain is based, African governments can also enhance incomes and wealth creation through improvements in the marketing of cotton and value addition processing.

Utilization of the Regional High Volume Instrument (HVI) Technical Centers in Ségou and Dar es Salaam, combined with bale-by-bale testing of all cotton and the use of such information in marketing, could add 3-10 cents/lb to the value of cotton sales across Africa (see Pan-African Cotton Road Map: Marketing, Actions II.b.).[23]

Almost all exporters in Africa sell to merchants at ports rather than selling to textile mills at destination. This is a

strategy of risk minimization, as reputable international merchants rarely default on contracts, and can arrange forward sales to provide credit for the purchase of inputs. However, some companies, including the Cotton Company of Zimbabwe, are engaged in direct sales to textile mills in Asia and elsewhere, and such companies are able to internalize more of the margin between gin and textile mill. Cotton Chad famously operated a sales office out of Paris for about 15 years until the mid-2000s, proving that African companies can compete successfully in international markets. African cotton companies would be well advised to begin building human capital in marketing functions by gradually diversifying sales with a view to expanding direct sales by mills over time (see Pan-African Cotton Road Map: Marketing, Actions I.d and e.).

Sub-Saharan Africa accounts for 6 per cent of world cotton production, an activity that supports millions of farming households. Moreover, cotton exports are a major source of foreign exchange. However, this subregion accounts for just 1.5 per cent of world cotton mill use. Problems with electricity supply, a lack of trained workers, poor logistics and communications, and distance from fashion centres and textile markets pose difficulties for the development of the textile industry. Probably the most harmful single policy that governments have utilized in efforts to foster value added production has been to reduce prices paid for cotton to producers in order to provide cotton to textile mills at below-market prices. Such policies harm millions of farmers while providing benefits to companies that employ only a few thousand workers, resulting in large inefficiencies.

Despite difficulties, there are some textile companies that operate successfully in Africa, and their examples deserve emulation and encouragement. Relatively large and growing industries exist in Ethiopia, Mauritius and the United Republic of Tanzania. In each of these countries, the governments have ensured the availability of utilities and infrastructure, and have facilitated worker training, while private investment has provided capital and management. Africa has numerous advantages as a location for textile production, including the availability of cotton. It also benefits from trade preferences in the European Union and the United States. African governments could study the success stories, where they exist, for ideas on how best to facilitate private sector expansion of the textile industry (see Pan-African Cotton Road Map: Value Addition, Actions II.c and c.).

6. Concluding remarks

The Farm Bill of 2014, also referred to as the United States “farm bill,” will provide substantially less support to the cotton sector in the United States than has been provided under previous farm bills. Given that the United States Government is mandating the use of biofuels in the country’s fuel supply, prices for corn and soybeans will probably remain higher, on average, than they were in the past. Accordingly, domestic cotton production is likely to trend downwards toward 3 million tons of lint per year over the next five years as harvested area in regions where cotton competes with corn and soybeans moves towards the production of biofuel crops. The increases in prices of corn and soybeans will also affect planting decisions in other major cotton-producing countries. Accordingly, there is likely to be a reduced supply of cotton from competing exporting countries, especially the United States, in the future.

China supported prices in the world cotton market during 2011/12 through 2013/14 through purchases for the State Reserve, and these purchases are likely to be reduced. The Government of China will probably pursue a slow and managed liquidation of the Reserve over many years, allowing prices to gradually move lower towards the long-run average of the Cotlook A Index of 73 cents/lb. While no farmer would like to see prices decline, cotton must compete with polyester in the world fibre market, and lower cotton prices will enhance the quantity of cotton being used in textile mills.

With competitive pressures from other exporters weakening over the next five years, and the quantity of cotton being used in the textile industry rising as prices gradually decline, there will be opportunities for increased production and exports of cotton from Africa. Starting from a small base, there will also be opportunities for expanding textile industry activity in Africa. There is now convincing empirical evidence that the cotton sector requires strong regulation of private sector activity in order to ensure adequate delivery of inputs to growers and the procurement of seed cotton. African governments can emulate the best practices already being implemented in several African countries in order to facilitate and foster increases in cotton yields and production.

Footnotes

[1] While the provisions of the farm bill are effective until 2018, it is standard practice in the United States for the Congressional Budget Office to estimate the budgetary requirements over a 10-year period.

[2] Unless otherwise indicated, all data used in this report are from various reports of the International Cotton Advisory Committee (ICAC).

[3] Some area is planted with crops every year which are not harvested for a number of reasons. For instance, farmers might become ill, or prices could decline, or labour for harvesting may not be available, or weather might be poor resulting in such low yields that the crop is not worth harvesting. Yields are reported in terms of harvested area, not planted area, and harvested area is assumed to be a better reflection of farmers' interests in a particular crop.

[4] United States Department of Agriculture (USDA), Economic Research Service, various publications.

[5] About 95 per cent of all cotton in the world is classified as "upland", an archaic term from the United States colonial period. The first cotton grown in the colonies that would become the United States was planted on islands off the coast of Florida, Georgia and the Carolinas. This was known as Sea Island cotton, and small amounts are still produced. As colonists moved onto the mainland, they needed different varieties for the different agronomic conditions. The new varieties were called "upland", a name that persists even today.

[6] Counties are subsets of state governments in the United States; a typical state might be subdivided into 100 counties for administrative purposes. The State of Texas, for example, has 254 counties.

[7] See: http://www.rma.usda.gov/policies/.

[8] The AWP is calculated by USDA from the Cotlook A Index "adjusted" to average location and quality in the United States. It is a proxy for the average farm price in the United States.

[9] GSM stands for General Sales Manager.

[10] See: http://www.ers.usda.gov/agricultural-act-of-2014-highlights-and-implications/crop-insurance.aspx#.U0_hol54X1o.

[11] "Out of the money" is a technical term in options trading, meaning that the price at which the option would be exercised is 10 per cent lower than the price that prevailed in the market at the time the option to sell was purchased.

[12] Season averages of the Cotlook A Index were near or within a few cents of 57 cents per pound several other times, but the Index itself is an estimate of market levels, and differences of a few cents are not statistically significant when evaluating programme impacts.

[13] See: https://www.icac.org/cotton_info/publications/statistics/stats_wtd/gm-e_2013.pdf.

[14] IMF, World Economic Outlook: Transitions and Tensions (October 2013) and WEO Update (January 2014).

[15] OECD, *Global Economic Outlook 2014*, February 2014 update; available at: https://www.conference-board.org/data/globaloutlook.cfm.

[16] UN DESA, Population Division, World Population Prospects: The 2012 Revision - Highlights and Advance Tables, Working Paper No. ESA/P/WP.228, table S.2, Total Population by Country, 1950, 2013, 2025, 2050 and 2100 (medium variant).

[17] This is Chinese official statistics; estimates of production in China vary by source.

[18] Institute of Cash Crops, Xinjiang Academy of Agricultural Sciences, Xinjiang cotton production: Status and its problems. Presentation at the 32nd International Cotton Conference, Bremen, March 2014.

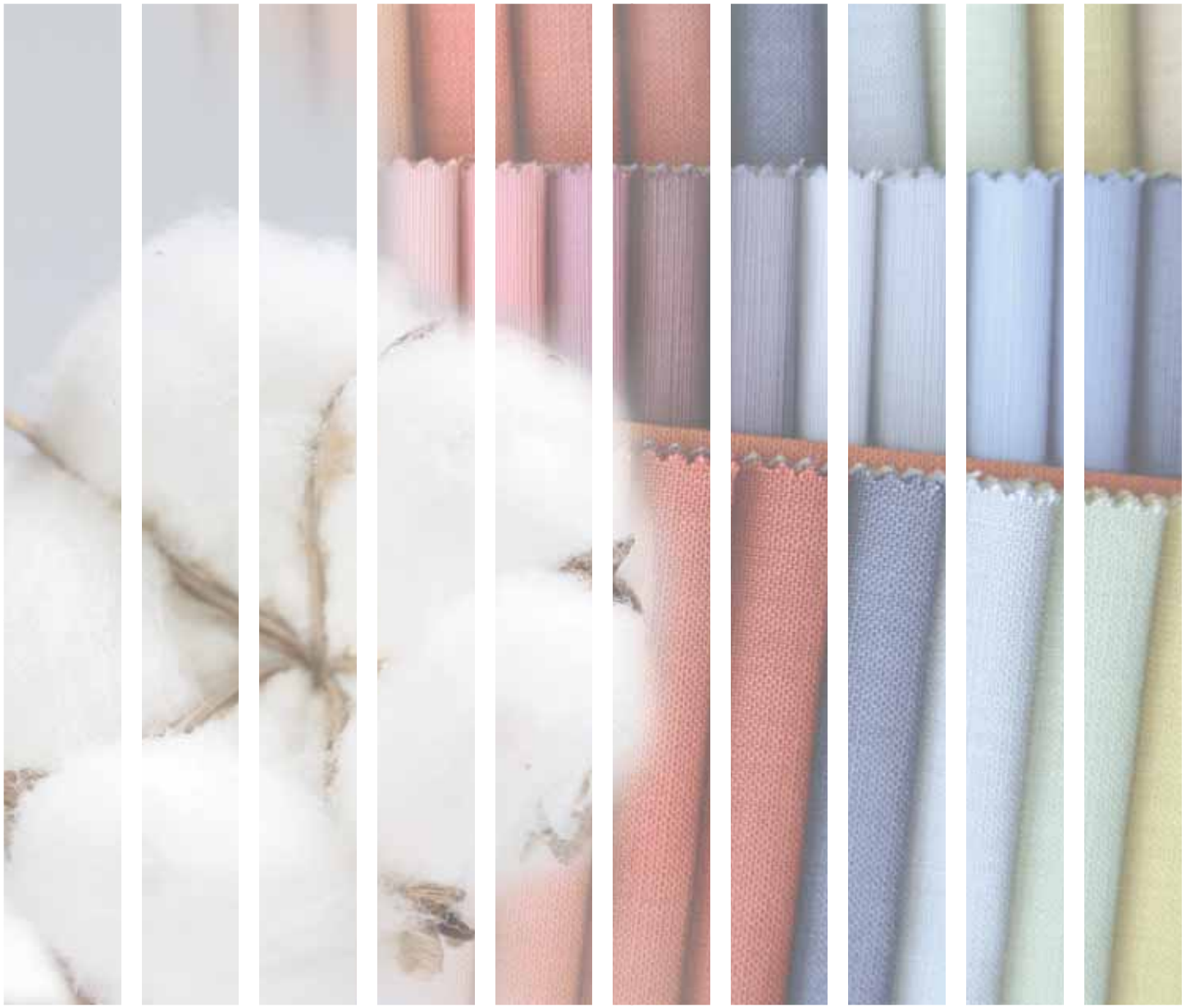
[19] According to an ILO high-level mission report on the monitoring of child labour during the 2013 cotton harvest in Uzbekistan, "Some child labour still takes place during the cotton harvest but to a limited extent. It appears to the Mission that forced child labour has not been used on a systematic basis in Uzbekistan to harvest cotton in 2013."

[20] See: https://www.icac.org/cotton_info/research/productionpractices/tisdocs/prod_prac2011.pdf.

[21] See, for example, World Bank, Organization and performance of cotton sectors in Africa: Learning from reform experience, 2009; Tschirley DL, Poulton C, Gergely N, Labaste P, Baffes J, Boughton and Estur G, Institutional diversity and performance in African cotton sectors. *Development Policy Review,* 28 (3): 295-323, 2010; Tschirley D, Poulton C and Boughton D, The many paths of cotton sector reform in Southern and Eastern Africa: Lessons from a decade of experience. In: Moseley WG and. Gray LC, eds. *Cotton, Natural Resources and Society in sub-Saharan Africa*. Ohio University Press, 2008. Please provide the page numbers for this chapter. I am referring to the entire publications, not just one chapter or section in each.

[22] See UNCTAD/SUC/2014/6, Pan-African Cotton Road Map (http://unctad.org/en/Pages/SUC/Commodities-Special-Unit.aspx).

[23] Ibid.



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