

## Chapter 10

# Cotton

*This chapter summarises the current situation and medium-term projections for world cotton markets during 2014-23. Expected developments in national and global cotton prices, production, use, trade (imports and exports) and stocks, and the background to these developments, are discussed. The underlying quantitative projections are developed with the aid of the partial equilibrium Aglink-Cosimo model of world agriculture. A separate section examines China's cotton policies, which are a significant source of variation and uncertainty during the outlook period. Other sources of uncertainty addressed include shifts in consumer demand and trends in both agricultural and industrial technology.*

## Market situation

World cotton prices in 2013 were influenced by competing forces, with world demand again rising after a prolonged decline that began in 2007 and elevated stock levels creating uncertainty about future prospects. Falling prices for grains and oilseeds helped reduce cotton prices, but tight supplies of high quality cotton in the United States offset some of this impact. World cotton stocks rose for the fourth consecutive year, but again most of the increase was accounted for by official reserve building in China. Consumption continued to decline in China – the world’s largest industrial consumer by a large margin – but increased in a number of other countries as China’s yarn imports rose sharply. Steady to higher world production is widely foreseen in the coming year, with early reports indicating an intention of US farmers to plant 4.5 Mha, a 7% increase. China’s area is expected to decline, as the support for farmers in China’s eastern provinces is reduced.

## Projection highlights

World cotton use is expected to grow at 2.4% p.a., a rate slightly above the long term average of 1.9% over the coming decade. In 2007, world consumption reached a peak of 26.7 Mt, and following significant declines during 2008-11 – and with a relatively slow recovery – this peak is not likely to be surpassed again until 2016.

- World production is expected to grow more slowly than consumption during the first years of the outlook period, reflecting the large global stocks that accumulated between 2010 and 2014. World cotton area grows throughout the projection period, finally surpassing in 2020 the recent peaks seen in 2004 and 2011. Yields rise around the world, but global average yield grows very slowly as global output switches from relatively high-yielding countries, like China, to relatively low-yielding ones in South Asia and Sub-Saharan Africa.
- World trade rises at a rate above its long-term average in the Outlook, with exports in 2023 12% above those in the base period. The United States retains its position as the world’s largest exporter accounting for 24% of world trade. India retains its position as the world’s second largest source of cotton while increasing its global share from 18% in the base period to 20% of exports by 2023.
- China retains its position as the world’s largest import market for cotton throughout the outlook period. But, by 2023 China’s share of world trade is foreseen 16 percentage points below its base period 47% share. Bangladesh’s share rises more than any other importer, up from 8% to 12%. Viet Nam, Turkey, Pakistan and Indonesia are also expected to realise larger shares.

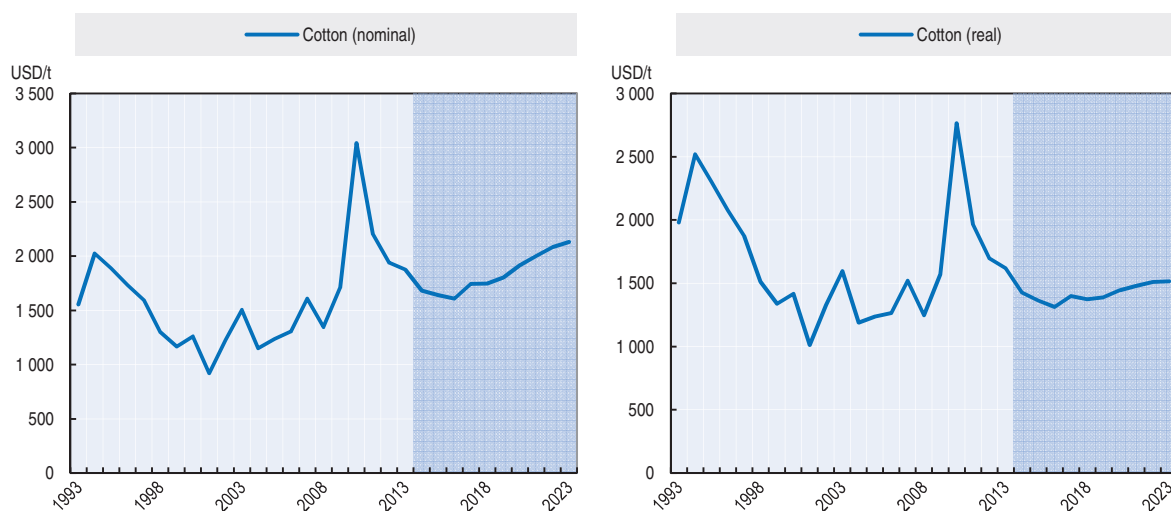
## Market trends and prospects

### Prices

The benchmark A Index measure of cotton prices delivered to Asian ports is expected to average below its 2012 level (USD 1 938/t) during 2013, despite a mid-season recovery (Figure 10.1). World cotton markets in 2013 continue to be indirectly influenced by the 2010 price spike, as the stock-building efforts begun by China in the wake of the price spike continue to support prices. After rising 78% in 2010, the A Index fell 28% in 2011 and is estimated down an additional 15% from that point in 2013. Variable prices are expected over the outlook period, generally falling through 2016, but rising afterwards. While rising, prices remain below USD 2 200/t in every year of the projection period.


Figure 10.1. **Cotton prices rise between 2000-09 and 2014-23**

Evolution of world cotton prices in nominal (left) and real terms (right) to 2023<sup>a</sup>



Note: Cotlook Ltd A Index: a) Real cotton prices are nominal world prices deflated by the US GDP deflator (2005 = 1).

Sources: Cotlook Ltd and OECD and FAO Secretariats.

StatLink  <http://dx.doi.org/10.1787/888933100853>

China's efforts to ensure its producers receive about USD 3 200/t resulted in a significant accumulation of stocks starting in 2011. In addition to a significant share of the domestic crop, the reserve authorities have purchased cotton from outside of China. The withdrawal of millions of tons of cotton from world markets has supported world prices, particularly after December 2012, as the world economy strengthened. China has signalled its intention to reform its cotton support programme, and to move to reduce its stocks. The shift from building stocks to reducing them in China is one of the major factors behind a decline foreseen in world cotton prices during the early years of the outlook period.

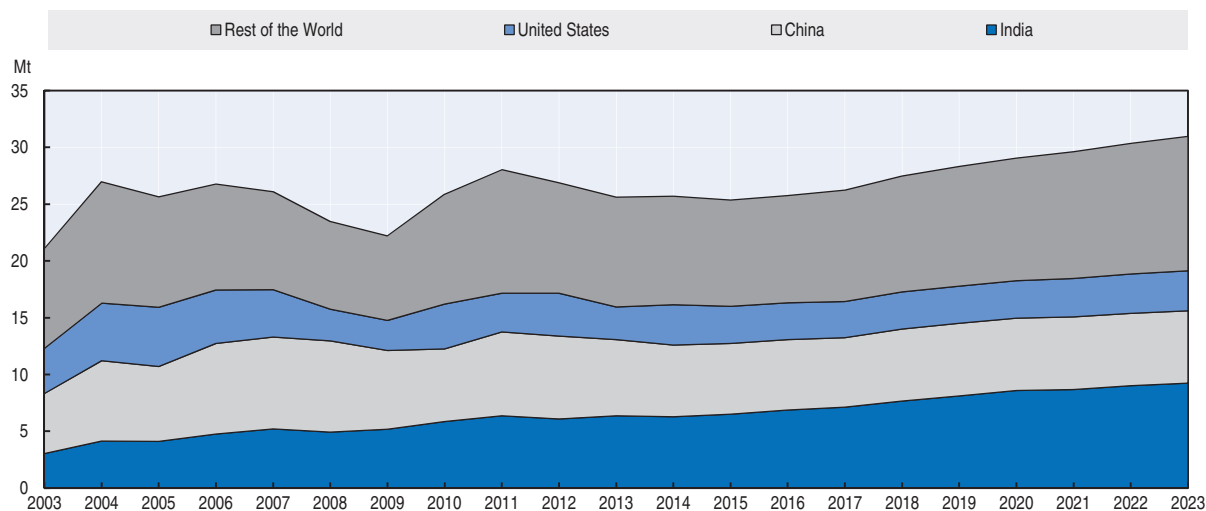
The outlook period's highest level for world cotton prices is 6% above the base period average. Cotton prices in 2014-23 are expected to be significantly higher than in previous decades. They are expected to average USD 1 835/t, 38% more than in 2000-09. However, this is a smaller long term gain compared with wheat and corn, which are forecast to average 40% and 68% higher than in 2000-09. Cotton prices shifted downward relative to a variety of other commodities during 2000-09, including crops that compete with cotton for planted area, like wheat, corn, and soybeans. Cotton prices are not expected to rise enough in the projection period to return to their earlier relative price levels.

### Production of cotton

World cotton production is projected to grow 2.2% annually in the *Outlook*, reaching 31.0 Mt in 2023. This total is expected to be 15% higher than production in the base period. Following the 2008 global financial crisis and subsequent cotton price volatility, world cotton production starts from a relatively low level in 2013, and rises as world consumption rebounds. Cotton yields are expected to rise in most countries, but the simple global average yield is expected to rise only 4.6% over the projection period as global production becomes increasingly concentrated in countries with relatively low yields. In particular, the roles of India and China will switch, with India replacing China as the world's largest producer starting in the first year of the outlook period.

Output is expected to fall in China, the world's largest producer since 1982 (Figure 10.2). While achieving high per hectare yields, China's cotton producers – particularly in its eastern provinces – utilise relatively labour-intensive technology. With a high share of labour in production costs, China's steadily rising wages have constrained profits for cotton growers, while rising subsidies for grain production have further eroded the relative attractiveness of producing cotton. Fragmented land holdings limit the ability of cotton growers in the eastern provinces to adopt mechanised production, while demographic trends indicate continued declines in rural population and rising wages are likely in the future. Mechanisation has been more applicable for the larger producing units in China's Xinjiang province, where per hectare yields are the highest of any province. China has indicated that 2014 will begin a period of reform for its cotton policy, beginning with a reduction of support to farmers in the eastern provinces (Box 10.1).

Figure 10.2. World cotton production by major producer



Source: OECD and FAO Secretariats.

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India is expected to replace China as the world's largest cotton producer in 2014, and is expected to account for 30% of world output in 2023. As Indian farmers continue to apply new and existing technology to capture currently unrealised yield potential, rising relative cotton prices on world markets will add additional incentives for Indian farmers to

### Box 10.1. China's cotton policies drive large changes in world ending stocks

Between 2010 and 2013, China's ending stocks of cotton rose by almost 350%. China's share of world cotton stocks rose from 19% to 54% during this time, with government-owned reserves accounting for the entire increase. The size of global cotton ending stocks in 2013 and the share of these stocks held by a single country are unprecedented in at least the last 50 years. The rise of China's official reserve stocks has noticeably affected world cotton supply and demand in recent years, and changes in China's cotton policies are expected to continue influencing cotton markets in the forecast period.

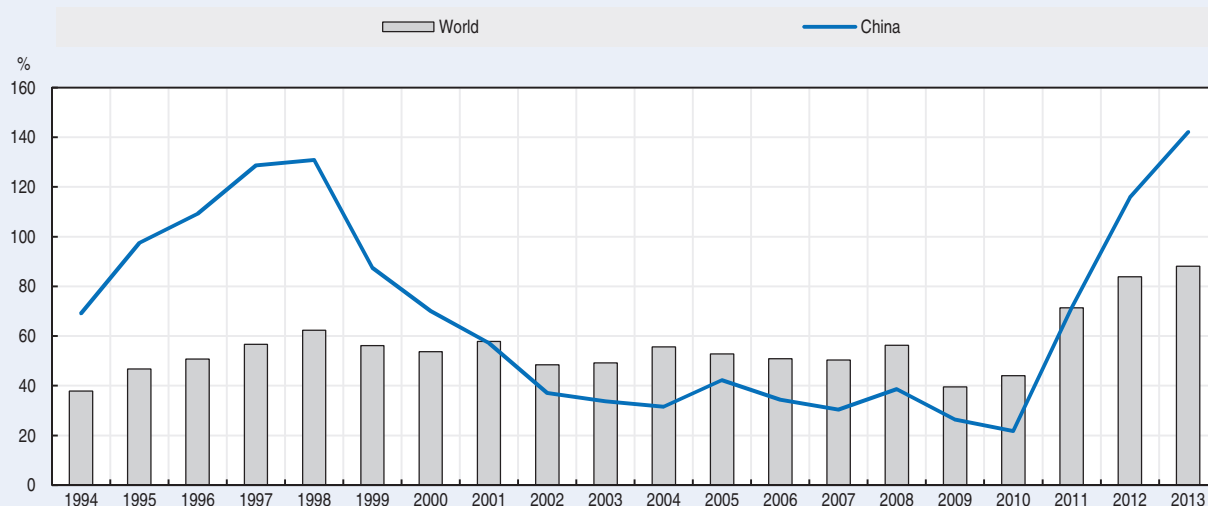
The government significantly altered its cotton policy in 2011, announcing a fixed price below which it would purchase cotton for its reserve through the annual harvest. This price was set below peak levels that occurred in 2010, but significantly above the levels that have prevailed on world markets since then. China is expected to begin altering its policy in the 2014 marketing year (September-August), reducing the amount of support offered to farmers and the gap introduced between cotton prices in China and the rest of the world since 2011. The large size of official reserve stocks makes the evolution of China's cotton policy in 2014 and beyond important to world cotton markets.

While China's share of world cotton stocks rose, its share of world cotton consumption fell. The rise in the domestic price of cotton in China relative to the world market price significantly constrained the profitability of spinning cotton fibre in yarn. China's trade deficit in cotton yarn rose significantly, and the textile industries of countries like India, Pakistan and others increased their consumption of cotton to meet this demand. One of the aims of China's cotton policy reform will be to limit the distortionary impact of support for cotton farmers. If China's domestic cotton prices can be returned to a level closer to world prices, the textile industry will probably be able to recover much of the share of world spinning lost during 2011-13. The appreciation of the Chinese Yuan Renminbi during this time, and steadily rising wages, will limit China's ability to return to the peak share of 42% realised before 2011, but could be significantly higher than the 33% realised in 2013.

China indicated that support for cotton producers will shift to a more targeted, less distortionary policy in 2014. Cotton producers in Xinjiang province will be the only producers to receive new, target price based direct subsidies. Producers in other provinces can expect to receive lower returns, and lower cotton production in 2014 is expected as a result. Lower production, combined with higher consumption, will begin the process of lowering China's reserve stocks. Other policy changes, likely in 2014 or in later years, include changes in trade policy and efforts to sell reserve stocks at lower prices. Production policy in 2014 is described as a pilot program, and the evolution of policies regarding cotton production, trade and management of official reserves will have potentially significant impacts on world markets for several years.

Figure 10.3. Cotton ending stocks rise sharply

Stock to use ratio



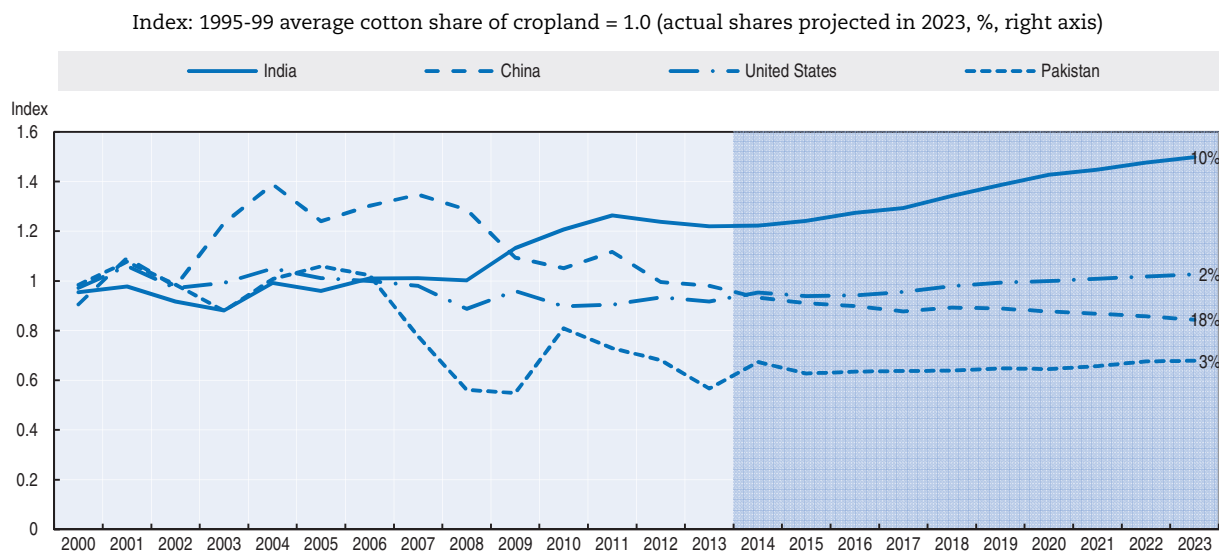
Source: International Cotton Advisory Committee, Cotton: World Statistics, September 2013.

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increase planted area and output. While there is a scientific debate around the use of genetically modified (GM) crops, the adoption of GM cotton in India has been part of shift in practices and technology that led India's cotton production to more than double between 2000 and the base period. While GM adoption there is nearly complete, yields are expected to continue to grow, albeit at far below the 7.7% annual rate realised during 2000-09. With cotton area in India also rising slightly faster than harvested area for all grains and oilseeds, India accounts for the largest share of the expected gain in world production through 2023 (Figure 10.4).

Pakistan accounts for the second largest share of increased global production, and like India is expected to realise slightly faster growth in cotton area than in total grains and oilseeds area. However, this growth over 2014-23 will begin at a relatively lower base than in India. Cotton accounts for a larger share of Pakistan's planted area than in India, but this share fell after 2005 (Figure 10.4). Pakistan has lagged behind India considerably in the adoption of GM cotton, and cotton's share of planted area in the base period is down 9% from the last half of the 1990s.

Figure 10.4. **Cotton area relative to area for total grains and oilseeds in major producing countries**



Source: OECD and FAO Secretariats.

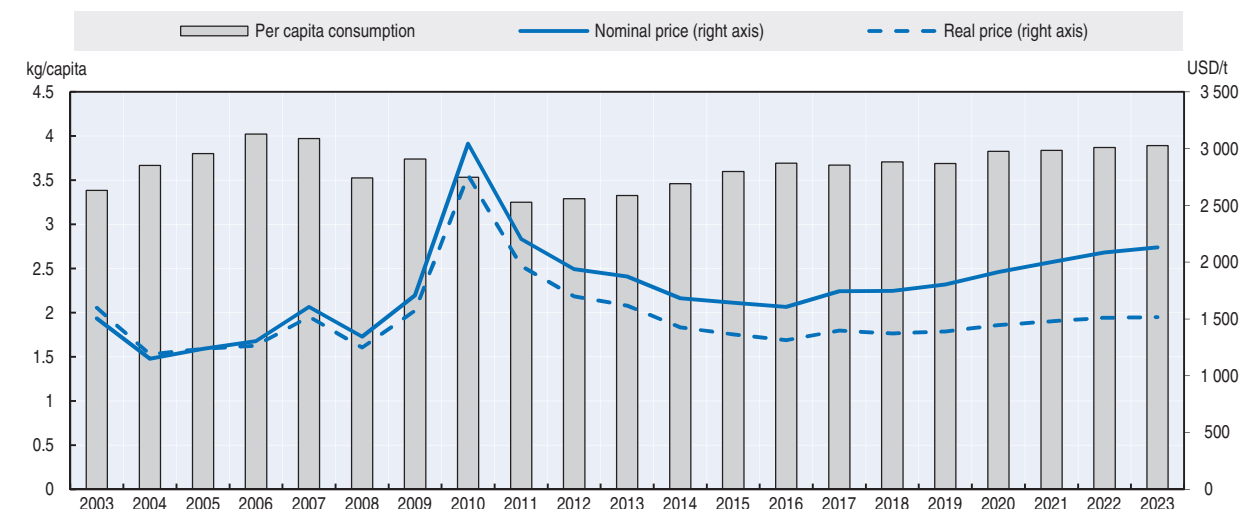
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Globally, the area planted to cotton is equivalent to 3-4% of the area planted to grains, oilseeds, and sugar crops. Total global area planted to these crops is expected to grow slowly during 2014-23 (0.4% p.a.), well below the rate of cotton area's expansion. However, cotton's share of this area total is still foreseen to be only marginally higher in 2023 than in the base period, 3.7% compared with 3.5%. The volatility of cotton prices in recent years and China's efforts to reduce its stocks mean that the early years of the projection are expected to be an unusually low point for cotton area, magnifying the growth rate expected during the outlook period. During the last half of the 1990s, cotton accounted for 3.8% of this global area total, but with substantial increases in productivity, a smaller share of crop area is now needed to sustain growing cotton production.


### Consumption of cotton

Total demand for cotton is expected to reach 30.8 Mt in 2023, surpassing its previous record-high by 4.3 Mt. While cotton consumption is expected to grow slightly more rapidly than it has over the very long-term, it is expected to grow significantly more slowly than the 3% rate realised during 2000-09. While consumption grows faster than the world's population in the Outlook, consumption on a per capita basis in 2023 is nonetheless expected to remain below the peaks seen in the last half of the 1980s and again during 2004-07 (Figure 10.5).

Figure 10.5. **World per capita consumption of cotton remains below peak**

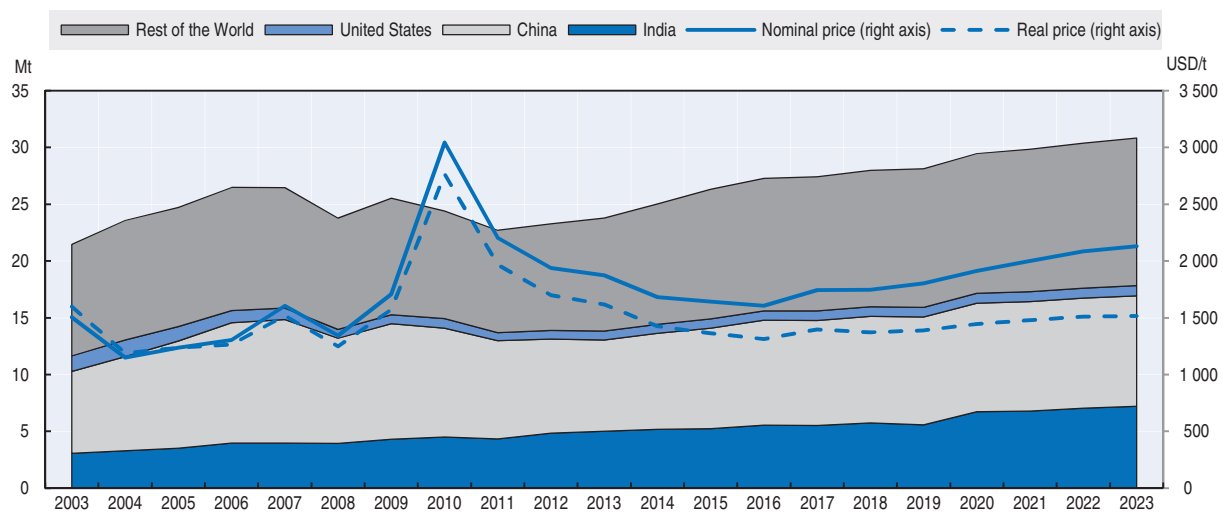


Source: OECD and FAO Secretariats.

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In recent years, cotton consumption has been disrupted by global economic volatility, an unprecedented price shock, and policy changes in China (Box 10.1). From a peak of 26.5 Mt in 2006 and 2007, world cotton consumption is estimated to have fallen 14% to 22.7 Mt in 2011. The outlook for world economic growth in the coming decade is more promising than during the base period and cotton prices have stabilised at more favourable levels relative to competing fibres. However, cotton prices are expected to remain high by historical standards and the global shift of textile production away from China's highly developed infrastructure may raise the average cost of supplying textiles to importing countries.

China is expected to remain the largest consumer of cotton fibre, its position since the 1960s. But China's share of world consumption is expected to decline, continuing a shift underway since 2007 (Figure 10.6). The age structure of China's population points to a decline in new labour-force entrants in coming years. With wages already rising steadily, China's comparative advantage is shifting away from labour-intensive industries like clothing. Government policies in minimum wages, pollution control, and investment will likely support this trend. Compounding this, the price of cotton in China has risen substantially relative to the world price since 2010 due to support policies for cotton farmers. While the reform of China's cotton programme is expected to boost China's share and level of cotton consumption early in the outlook period, China's share of world cotton consumption in 2023 is projected at 32%, down from 36% in the base period.

Figure 10.6. **World cotton consumption rebounds, but relatively slowly**

Source: OECD and FAO Secretariats.

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India's textile industry has been the largest beneficiary of China's shift away from processing cotton fibre into textiles during 2011-13. India recently became the world's largest exporter of cotton yarn, and by 2023 will be closing in on China to have the world's largest domestic market in population terms. China's reforms starting in 2014 are expected to moderate India's increased consumption between the base and the first few years of the outlook period. At 7.2 Mt expected in 2023, India's cotton consumption continues on its trend of a growing world share, which rises from 20% to 23%.

The fastest growth among major consumers is expected in Bangladesh and Viet Nam. Consumption is expected to grow at a 4-5% rate in each country, as their textile industries continue the rapid expansion each has enjoyed since 2000. While Bangladesh had been widely expected to see a reduction in its textile exports after the phase-out of the Multi-fibre Arrangement (MFA) in 2005, its garment exports and cotton spinning have instead flourished. Cotton consumption in Bangladesh grew at a 6.6% rate during 2004-13, and at a 14.0% rate in Viet Nam.

### Cotton trade

Cotton trade is expected to grow relatively strongly during the outlook period. Trade will be boosted by China's return to world markets in the latter part of the projection period and by the continued expansion of textile output in countries which are large net cotton importers. Traditionally, cotton has been a relatively highly trade-dependent crop, with a ratio of world trade to world consumption of 30-45%, compared with ratios below 20% for grains and below 30% for soybeans. In the *Outlook*, exports are expected to grow at above the rate of world consumption, reaching 10.6 Mt by 2023. The ratio of trade to consumption is expected to fall from a relatively high 41% in the base period, reaching 34% in 2023.

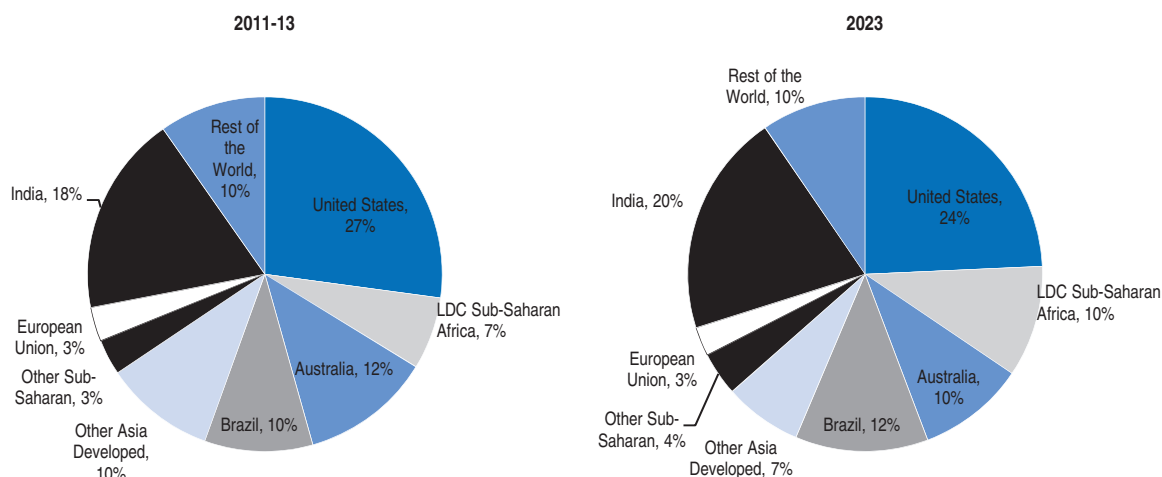
The leading exporter throughout the *Outlook* will be the United States, while India's exports are expected to remain the world's second largest (Figure 10.7). In the decades before its post-2000 surge in productivity and production, India was a minor factor on



world markets. India frequently imposed export quotas to maintain low cotton prices for its textile industry, and it was a net importer for seven consecutive years between 1998 and 2004. But more recently, India has at times accounted for as much as 24% of the world's cotton exports. By 2023, its share is forecast to be larger than in the base period, but only by a small margin as consumption gains begin to approach growth in output.

Figure 10.7. **World cotton trade shares by exporter**

2011-13 and 2023



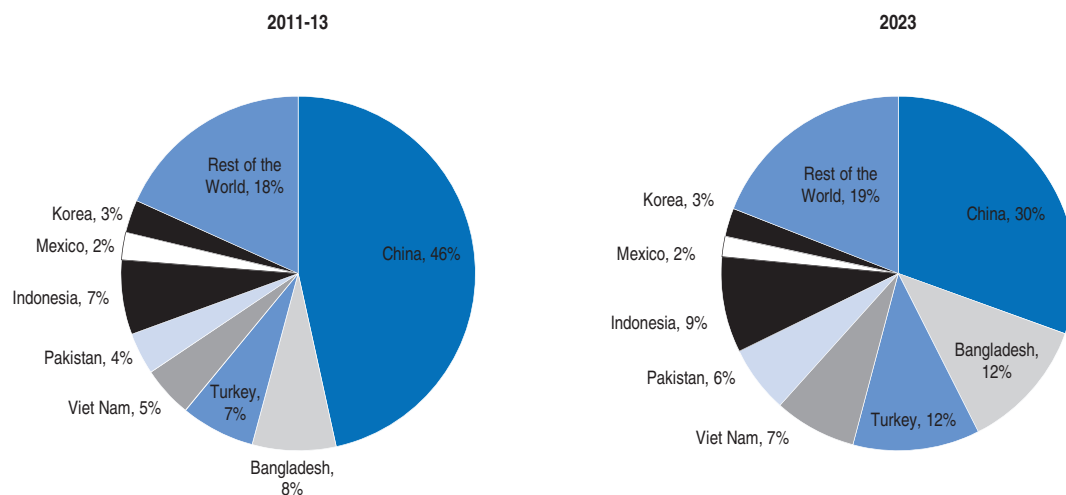
Source: OECD and FAO Secretariats.

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Least Developed (LDC) Sub-Saharan Africa is expected to see a recovery of its share of world trade by 2023, growing from 7% to 10%. However, the region's share of world trade has been relatively variable in the last few decades, typically ranging between 7% and 13%. Cotton consumption is limited throughout Sub-Saharan Africa, and many countries export virtually all of their production. From a high of 926 000 t in 2004, LDC Sub-Saharan Africa's production fell below 400 000 t by 2009 as relative cotton prices reached new lows. With the recovery of world cotton prices, and expected yield gains in the region, production, exports and share of world trade are expected to rise through 2023.

Like exports, shifts in the composition of importers represent the continuation of recent trends in the world cotton economy. China is expected to retain the role as world largest importer that it has held since shortly after its World Trade Organization (WTO) accession drove its consumption up sharply, but at a reduced level (Figure 10.8). As China's share of world imports falls from 47% in the base period to 31% in 2023, Bangladesh's 2023 share of world trade is expected to be nearly 60% larger than in the base period, and gains are also expected for Viet Nam, Turkey and Pakistan. As China's role in world textile production diminishes, cotton consumption is expected to grow more rapidly in a variety of countries, most of which are significant net importers.

Figure 10.8. **World cotton trade shares by importer**  
2011-13 and 2023



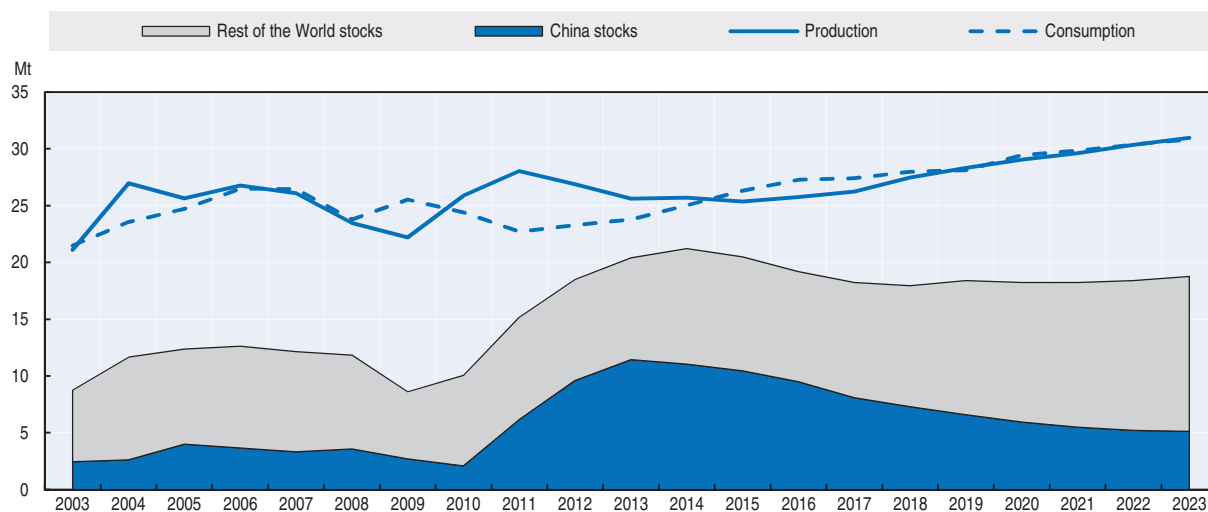
Source: OECD and FAO Secretariats.

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### Main issues and uncertainties

The level of consumer demand and its relationship to industrial demand for cotton fibre is an important source of uncertainty in the *Outlook*. The consumption of cotton projected is ultimately a derived demand: textile mills consume cotton to produce yarn used in clothing and other consumer goods. Due to textile trade, the geographic distribution of the consumption of these consumer products can differ significantly from the distribution of cotton fibre consumption. Due to significant value-added in the production of consumer products, and substantial opportunities to substitute other fibres for cotton, the relationship between consumer spending on clothing and the volume of cotton consumed can vary significantly. World cotton consumption over the long run has grown at a 1.9% p.a. and is expected to grow 2.4% in the *Outlook*. World consumption typically does not grow smoothly at the long run rate, but has periods of relatively high or low growth. If the *Outlook's* assumptions of relatively strong economic growth and no significant technical change prove incorrect, then cotton consumption might grow at a different rate.

China's cotton policies are another important source of uncertainty in the *Outlook*. As the world's largest producer, consumer and importer in the base period, China's developments are important to understand under any circumstances, and its recent policy changes have heightened this importance. During 2011-13, China provided substantially more support to its cotton farmers than earlier, and did so primarily through maintenance of high domestic cotton prices. The *Outlook* assumes that the steps China has indicated to reform its cotton policies in 2014 will be expanded in the following years. While the changes that have been most clearly outlined to date have focused on support for farmers, there are also indications that policy-makers regard the unusually large stocks that China has accumulated since 2010 as unsustainable (Figure 10.9). The result could be higher consumption by China's textile industry, but possible changes in trade policy could also be used by China to accelerate a reduction in stocks. These changes would have implications for the outlook in other countries as well.

Figure 10.9. **World cotton stocks shift out of China**

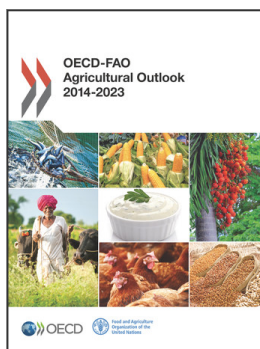
Source: OECD and FAO Secretariats.

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Prospects for productivity gains around the world are another uncertainty, particularly in India. The adoption of GM crops has been associated with an increase in total factor productivity in cotton in China, and significantly higher yields, area and output in India. In the United States, GM adoption and boll weevil eradication have reduced the cost of growing cotton, and in Australia the adoption of GM varieties specific to Australia has also raised productivity. It is likely that these factors account for some of the downward shift of cotton prices relative to other commodity prices since 2000. Many countries have been more cautious in their approach to GM adoption, motivated in part by trade restrictions some countries maintain on imports of food and feed products based on GM crops. Similar restrictions are not applied to cotton fibre, yarn, or other textile products, but GM adoption has been slow in many countries nonetheless.

Future productivity gains are also possible through the adoption of other technologies and farming practices. Thus, the completion of GM adoption by India's farmers in recent years does not necessarily mean that further significant yield gains are not possible. For example, newer GM traits have progressed to near-final approval stages. If the yield increases foreseen in this Outlook are not realised, cotton prices and cotton area in other countries would likely be higher.





**From:**  
**OECD-FAO Agricultural Outlook 2014**

**Access the complete publication at:**  
[https://doi.org/10.1787/agr\\_outlook-2014-en](https://doi.org/10.1787/agr_outlook-2014-en)

**Please cite this chapter as:**

OECD/Food and Agriculture Organization of the United Nations (2014), "Cotton", in *OECD-FAO Agricultural Outlook 2014*, OECD Publishing, Paris.

DOI: [https://doi.org/10.1787/agr\\_outlook-2014-13-en](https://doi.org/10.1787/agr_outlook-2014-13-en)

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