10 Cotton

This chapter describes recent market developments and highlights the medium-term projections for world cotton markets for the period 2021-30. Price, production, consumption and trade developments for cotton are discussed. The chapter concludes with a discussion of important risks and uncertainties that might affect world cotton markets over the next ten marketing years.

10.1. Projection highlights

Cotton consumption and trade recovered in 2020 from the 2019 low. However production fell to levels not seen since 2016 as production in the Americas was below expectations. As a consequence, cotton prices increased and gained on the price of polyester. Driven by the assumption that the price ratio between cotton and other fibres will be more stable over the outlook period compared to recent years, global mill consumption is expected to grow slightly faster than world population. The distribution of consumption across the globe depends on the location of cotton mills, often located in proximity to clothing and apparel industries. Over the past decades, there has been a marked shift in cotton mill activity from the developed world and the former Soviet Union towards Asia, especially the People's Republic of China (hereafter "China"). Chinese consumption peaked in 2007 and has been declining since as stricter regulations and rising labour costs have stimulated a move of the industry to other Asian countries, notably Viet Nam and Bangladesh. Since 2016, the decline in Chinese mill consumption seems to have ceased and this year's edition of the *OECD-FAO Agricultural Outlook* assumes a slight upward trend for the coming decade. In India, another major cotton consumer, support to the sector is expected to result in continuous growth in cotton mill use.

World cotton production is projected to grow 1.5% p.a. to reach 28 Mt in 2030. This growth will come from an expansion of the cotton area (0.5% p.a.) and growth in average global yields (1% p.a.). Yields have been flat since 2004 as several countries have struggled with pest problems and water scarcity, and because production shares of low yielding countries have been increasing. Better genetics and the adoption of better agronomic practices for sustainable cotton production could bring improvement over the coming decade, but yield growth could remain a challenge in several countries. India will continue to be the world's largest cotton producer, with the increase in production resting mostly on higher yields, while area expansion is expected to be limited in line with recent trends. In general, the global players in cotton markets in 2030 will be the same as in the base period, which means that Sub-Saharan Africa as a region is projected to remain the third largest exporter of raw cotton by 2030 (Figure 10.1).

Cotton is mainly traded in bales of raw cotton fibres. The global trade in raw cotton is projected to surpass 11 Mt by 2030, 25% higher than during the base period. Global trade is therefore expected to grow slightly faster than overall consumption given the demand growth in countries without much domestic cotton production, such as Bangladesh and Viet Nam, and stagnating domestic mill use in Brazil.

After trending downwards since 2017, global cotton prices are expected to increase over the projection period in nominal terms, while decreasing slightly in real terms. Assuming China resumes its efforts towards a greener economy, polyester production should be dampened. This decrease in the rate of growth of polyester production should lead to increasing nominal cotton prices in the coming years.

Several uncertainties affect the outlook period under study. It is unclear how per capita consumption of cotton textiles in developing and emerging economies will evolve as incomes grow and urbanisation continues, especially given competition from polyester and the uncertainty related to how the global economy will emerge from the COVID-19 economic recession. On the production side, projections are sensitive to pests and weather conditions. Climate change, with its impact on the occurrence and magnitude of events such as droughts and storms, constitutes an additional factor of uncertainty. Sustainability considerations regarding cotton and man-made fibres will continue to influence the future demand and supply of cotton. Trade tensions are another source of uncertainty for cotton markets.

Figure 10.1. Global players in cotton markets in 2030
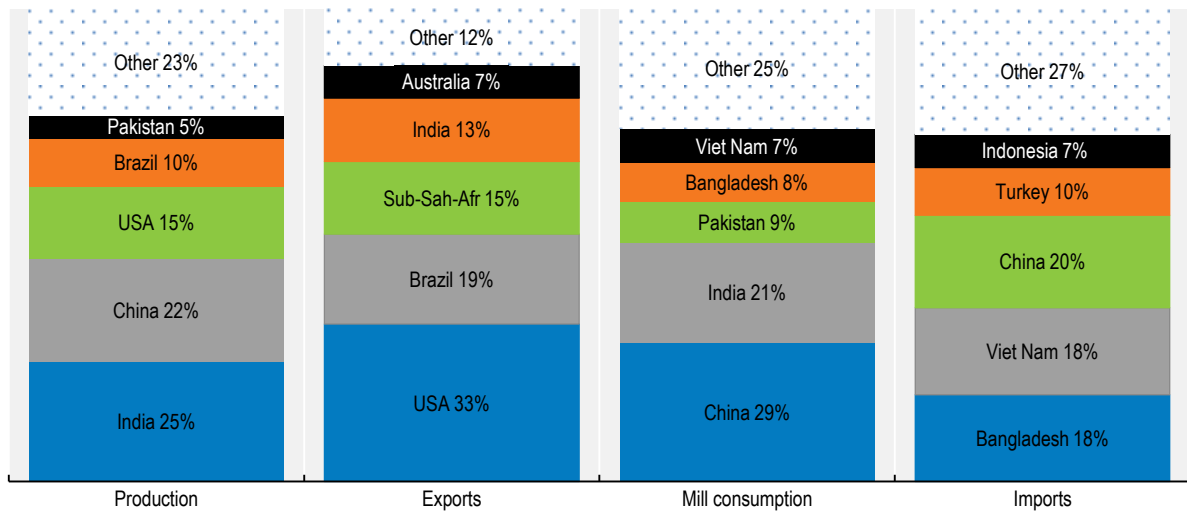
Note: Presented numbers refer to shares in world totals of the respective variable
Source: OECD/FAO (2021), "OECD-FAO Agricultural Outlook OECD Agriculture statistics (database)", http://dx.doi.org/10.1787/agr-outl-data-en.

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10.2. Recent market developments

During the first wave of lockdowns since the start of the COVID-19 pandemic, prices for raw cotton dropped strongly in the spring of 2020. The onset of the pandemic drove consumers from stores, with apparel retailers particularly affected, and it hindered yarn spinning in many countries. However, this price drop did not affect planting decisions as much as it would have had it happened a few months earlier. Nonetheless, the decrease in cotton production in the 2020/2021 marketing year was the highest since 2016 for several reasons: one cause was that corn and soybean prices had gained on cotton prices to some degree before the COVID shock, putting downward pressure on cotton area in several countries. Another reason was that in the United States, the harvested area was reduced by disappointing weather.

After the first demand shock, demand for goods was stronger than initially expected as government policies to sustain incomes for segments of the work force and the increased savings that were boosted by the large decrease in spending on services sustained demand for cotton. Consequently, global demand of raw cotton increased in 2020/2021.

World trade of raw cotton fell less than consumption in 2019/2020, and the rebound in world trade in 2020/2021 resulted in the highest trade volumes since the record-high of 2012. While international trade conflicts and the impact of the pandemic on consumption halted China's rebound in imports in 2019, in 2020 these reached their highest volumes in seven years. Pakistan, mainly in response to a shortfall in the 2020 output, increased its imports. In Bangladesh and Indonesia, imports have not fully recovered from their sharp drop in 2019 mainly due to the lingering effects of the pandemic on domestic textile industries. Cotton exports from India, a key exporter, grew more than 70% from the 2019 level, sustained by the depreciation of the country's currency and the rally in global cotton prices in the second half of 2020 and early 2021.

10.3. Prices

International cotton prices are expected to decrease in real terms throughout the outlook period, as world cotton demand remains under pressure from synthetic fibres, notably polyester. The decrease in real prices is equivalent to a slight increase in nominal terms. From the early 1970s, when polyester became price-competitive with cotton, cotton prices tended to follow on average polyester prices. For example, cotton prices were only 5% above polyester staple fibre prices between 1972 and 2009. Since 2010, however, cotton prices have been on average almost 40% above the polyester price. Polyester prices are not part of this *Outlook*'s projections; it is implicitly assumed that the relative competiveness between these two types of fibre does not change drastically, but that there are slight improvements in favour of cotton.

Figure 10.2. World cotton prices
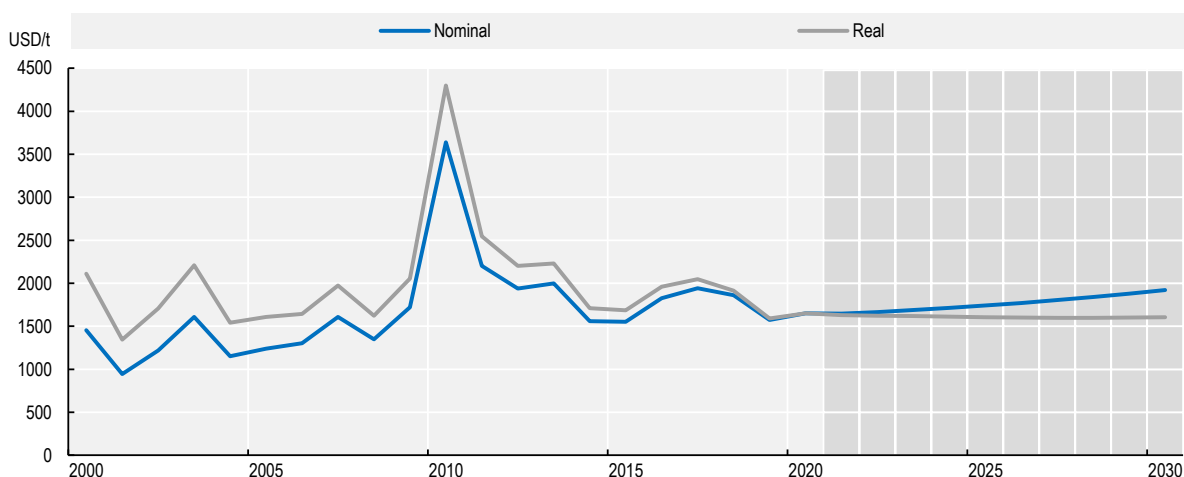
Note: Real prices are nominal world prices deflated by the US GDP deflator (2020=1). The reference cotton price is the Cotlook price A index, Middling 1 1/8", CFR far Eastern ports. Data shown represent the marketing year average (August/July).
Source: OECD/FAO (2021), "OECD-FAO Agricultural Outlook OECD Agriculture statistics (database)", http://dx.doi.org/10.1787/agr-outl-data-en.

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The cotton market has historically been sensitive to external shocks that have led to large price swings. In 2010/11, cotton prices more than doubled due to a mix of high oil and polyester prices, and unexpected high demand. The subsequent correction was only partial as both the additional demand from China and polyester prices progressively decreased (Chinese stockpiling progressively decreased up to 2014 and polyester prices decreased up to 2015/16).

The potential for external shocks to create volatility exists, but a repetition of the 2010/11 price peak seems unlikely given higher global stocks. However, decisions on destocking in China can affect projections. In the past three years, Chinese public stock levels seem to have stabilised after they decreased when the minimum support price system was removed in 2014. This *Outlook* assumes stocks to remain at currents levels, in line with recent trends. The future path of cotton prices is clearly sensitive to this assumption.
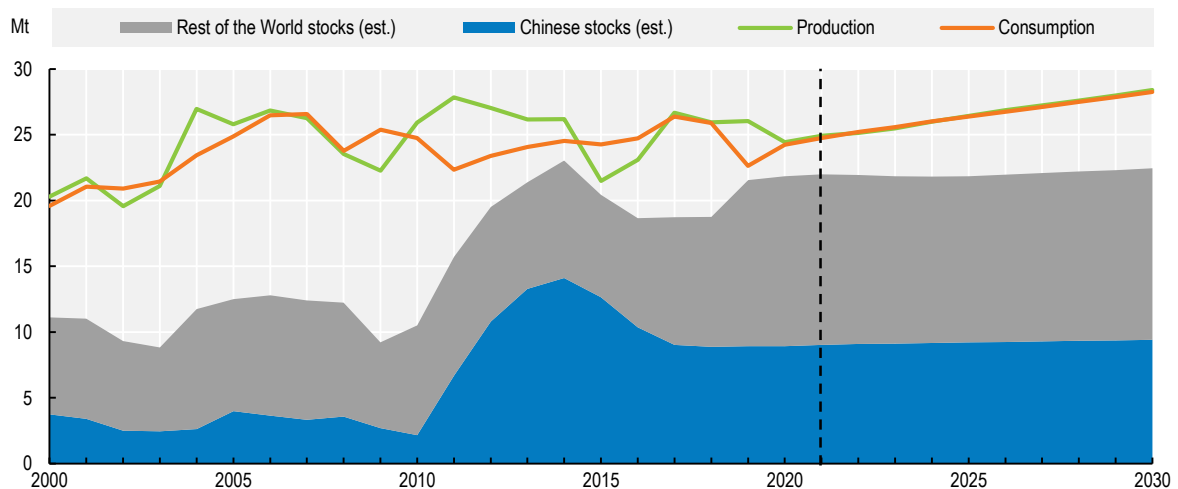
10.4. Production

Cotton is grown in subtropical and seasonally dry tropical areas in both the northern and southern hemispheres, although most of the world's production takes place north of the equator. The main producing

countries are India, China, the United States, Brazil, and Pakistan. Together, these countries account for more than three-quarters of global production (Figure 10.1).

Most of the production growth in the coming decade is expected to come from these countries, with India accounting for more than 40% of the global increase. At the global level, the cotton area is projected to expand by 1% while yields are projected to increase by 10% compared to the base period. In the last decade, global yields were stagnant, reflecting stagnant or decreasing yields for some major producers (United States, Pakistan, India), declining cotton area in China (where yields are well above average), and expanding cotton area in India (where yields are well below average). These factors are expected to continue to affect global yield trends in the coming decade, despite growth in both yields and cotton area in Brazil.

Figure 10.3. World cotton production, consumption, and stocks

Note: est. stands for estimate.
Source: OECD/FAO (2021), "OECD-FAO Agricultural Outlook OECD Agriculture statistics (database)", http://dx.doi.org/10.1787/agr-outl-data-en.

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Production in India is projected to grow by around 1.5% p.a. over the outlook period, mainly on account of higher yields rather than area expansion, since cotton already competes for acreage with other crops. Raw cotton productivity has remained stagnant in recent years and is among the lowest globally, as producers struggle with adverse weather, insect pests, and diseases. However, growing demand from the domestic apparel industry continues to spur investments in the sector and this *Outlook* assumes a growth in yields that reflects increased use of smart mechanisation, varietal development, and pest management practices. Nonetheless, climate change, with most cotton grown under rain-fed conditions, may undermine the yield growth potential.

Chinese cotton producers currently achieve yields that are more than double the world average, even though yields continue to be below the country's potential levels. Since further improvement may become more difficult, yield growth is projected to slow down to 0.6% p.a. Although in general the cotton area in China has been declining over the past decade, mostly due to changing government policies, this trend seems to have been halted since 2016. This *Outlook* expects a stagnating cotton area in China.

In Brazil, cotton is grown in part as a second crop in rotation with soybeans or maize, and output has recently grown strongly in the main growing areas, e.g. Mato Grosso. Favourable growing conditions and

a high rate of adoption of modern technologies have driven rising cotton yields and areas over the past years. This *Outlook* assumes that these factors support further production growth.

Figure 10.4. Cotton yields and area harvested in major producing countries
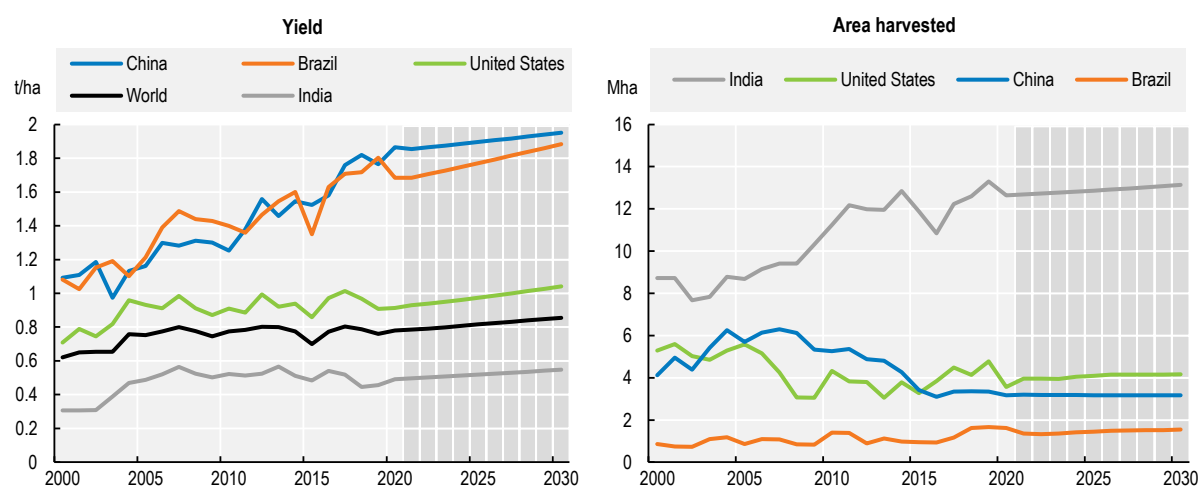
Source: OECD/FAO (2021), "OECD-FAO Agricultural Outlook OECD Agriculture statistics (database)", http://dx.doi.org/10.1787/agr-outl-data-en.

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10.5. Consumption

Cotton consumption statistics in this *Outlook* refer to the use of cotton fibres by mills for the production of yarn. This mill use depends on the global demand for textiles and on competition from substitutes such as polyester and other synthetic fibres. Over the past decades, global demand for textile fibres has grown strongly, but most of this demand has been met by synthetic fibres (Figure 10.5). Per capita consumption of non-cotton fibres overtook that of cotton in the early 1990s and has continued to grow strongly. By contrast, global per capita consumption of cotton fibres has increased little over time, and has even decreased in recent years. As a result, global cotton consumption peaked in 2007 at 27 Mt, but decreased to around 24 Mt in 2018-20.

The prospects for global cotton use depend on developments in developing and emerging economies. Data collected by the International Cotton Advisory Committee (ICAC) suggests that global per capita demand for cotton products decreased between 2007 and 2012, but that it has since stabilised (Figure°10.5). The effects of income growth should lead to a higher demand for cotton products. However, strong population growth in regions where per capita demand for cotton products is below average dampens this effect. Demand from developing regions with lower absolute levels of consumption but higher income responsiveness will put an upward trend on global demand as the incomes and population of these countries are projected to increase. As a result, this *Outlook* expects that global consumption of cotton products will grow at a slightly higher pace than global population in the coming decade. Correspondingly, global mill use is projected to grow by around 1.5% p.a. over the outlook period.

Figure 10.5. Historical trends in consumption of textile fibres

Global consumption

Mt
■ Cotton   ■ Wool   ■ Chemical fibres

Per capita consumption

kg/cap
— Cotton   — Non-cotton
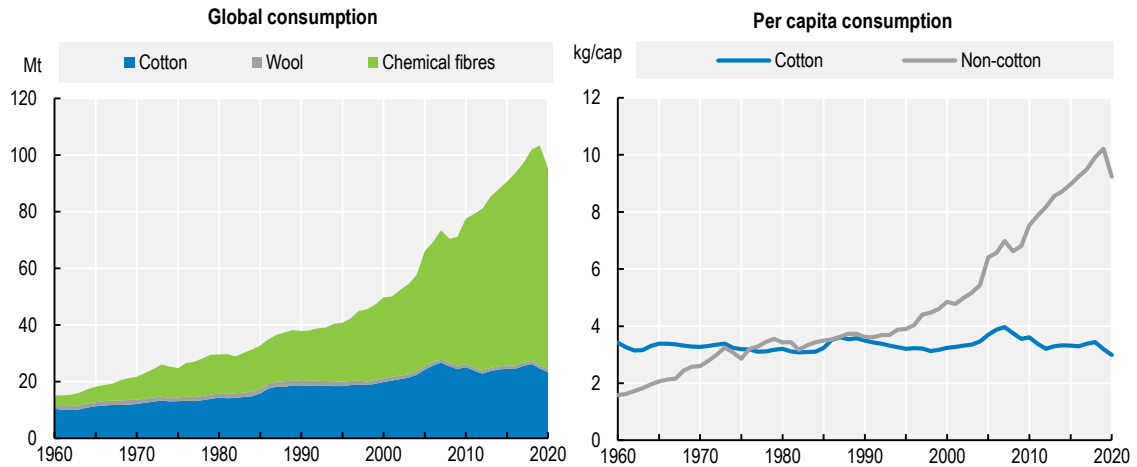
Source: ICAC World Textile Demand estimates, 2021.

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The distribution of demand for cotton fibres depends on the location of spinning mills, where cotton and synthetic fibres are spun into yarn. The greatest amount of yarn spinning occurs in countries where downstream industries are located, mostly in Asian countries with lower labour costs. China has been the world's largest consumer of cotton since the 1960s. Major shifts are taking place, however, with yarn production gradually moving from China to other Asian countries.

China's cotton mill consumption has been decreasing since the support price system was abolished in 2014. The artificially higher prices had caused a shift from cotton to synthetic fibres on the demand side. The decline in cotton demand also reflects structural change as higher labour costs and more stringent labour and environmental regulations provoked a move of the industry to other Asian countries, notably Viet Nam and Bangladesh. In recent years, mill consumption has regained some lost ground in China, in part because cotton prices have become more competitive when compared to polyester, which appears to have suffered a setback due to government measures to combat industrial pollution. Chinese spinning mill use is therefore assumed to maintain a slight upwards trend over the next decade under the assumption that cotton-based fabrics produced in the Xinjiang region will regain consumer trust. Human rights concerns with respect to the treatment of workers has raised concerns, especially in the United States, which has banned imports from that region.

Support to the sector in India is expected to result in continuous growth in cotton mill use. Cotton plays an important role in the Indian economy as the country's textile industry is predominantly cotton based. The textile industry represents an important component of the country's industrial production and is one of the largest source of employment. The industry, however, faces several challenges, including technological obsolescence, high input costs, and poor access to credit. To address these issues, the government has implemented several subsidy schemes and is currently developing a new textile policy for the overall development of the sector.

Figure 10.6. Cotton mill consumption by region
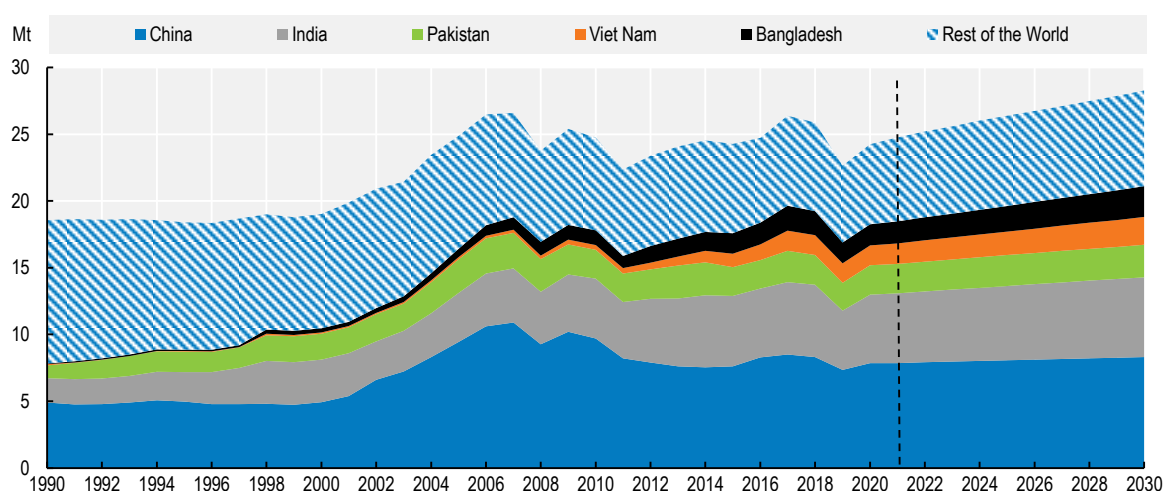
Source: OECD/FAO (2021), "OECD-FAO Agricultural Outlook OECD Agriculture statistics (database)", http://dx.doi.org/10.1787/agr-outl-data-en.

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The phase-out in 2005 of the Multi Fibre Arrangement (which had fixed bilateral quotas for developing country imports into Europe and the United States) was expected to favour Chinese textile producers at the cost of smaller Asian countries. In practice, countries such as Bangladesh, Viet Nam, and Indonesia experienced strong growth of their textile industry based on an abundant labour force, low production costs, and government support measures. In addition, the escalation of the United States-China trade dispute has spurred additional mill use in Bangladesh and Viet Nam. In the case of Viet Nam, this was partly driven by its accession to the World Trade Organization in 2007 and by foreign direct investment (FDI) by Chinese entrepreneurs. The rapid growth in these countries is expected to continue over the outlook period, with Bangladesh and Viet Nam expanding their mill use by 40% and Indonesia by 28% relative to the base period (the spinning industry in Indonesia faces challenges that are impeding further production growth, including increased production costs and lower labour productivity). Further growth is also expected in Turkey and Central Asia, where the textile industry is expanding in part thanks to growing exports to the European Union and the Russian Federation (hereafter "Russia").

Sustainability considerations will continue to influence future demand and supply of cotton. As shown in Table 10.1, the share of cotton lint produced under special sustainability or organic standards has increased steadily since 2010. In 2018, it reached a share of 25%. Among the existing standards, the Better Cotton Initiative dominates globally, accounting for more than 45% of sustainable cotton supply in 2018, followed by the Responsible Brazilian Cotton initiative with 35%. Brazil, where about 80% of cotton production is certified under these two initiatives, takes a leading role in global sustainable cotton production. It is most likely that the sustainable and organic segment will continue to grow in the future with the implication that this will lead to an increased need for transparency and traceability along the supply chain.

Table 10.1. Sustainable and organic cotton production

	Total production (1000t)	Sustainable and organic cotton production (1000t)	% share / total world production
2010	25 869	185	1%
2011	27 856	578	2%
2012	27 079	1 289	5%
2013	26 225	1 490	6%
2014	26 233	2 465	9%
2015	21 640	3 211	15%
2016	23 196	3 609	16%
2017	26 798	5 375	20%
2018	25 972	6 400	25%

Source: ICAC.

10.6. Trade

China is expected to remain the leading raw cotton importer over the next decade, followed by Viet Nam and Bangladesh. By 2030, imports in China are projected to increase by 17%, and in Bangladesh and Viet Nam by 41%, in line with mill consumption growth. These three countries will account for more than half of global cotton imports (Figure 10.1).

The United States will remain the world's largest exporter throughout the outlook period. Exports of the country have stabilised in recent years, recovering from the lows in 2016, and the US share of world trade is projected at 33% in 2030, compared to a 36% share in the base period. Recent trade tensions between the United States and China has placed some pressure in cotton shipments between the countries. Under the assumption of better trade relations in the future, the United States should regain some shares in Chinese raw cotton imports.

Brazilian exports are expected to grow strongly over the next decade as Brazil establishes its position as the second largest exporter by 2030, continuing to increase its share in global markets. India will follow as the third largest exporter with shipments projected at 1.5 Mt by 2030, 70% higher than in the base period.

Cotton is an important export crop for Sub-Saharan Africa, which currently accounts for 15% of global exports. Overall, cotton production in the region has increased in the past several years, mainly as a result of an area expansion, although in 2020 the decline in cotton prices led to a drop in acreage and production, particularly in Mali, a key producing country. Spinning mill consumption remains limited throughout Sub-Saharan Africa and many countries export virtually all that they produce. However, the textile and apparel industry is growing in some countries, especially Ethiopia, as the region presents some attractive conditions for FDI, which has been significant in recent years. In the long run, this might change the net export condition of Sub-Saharan Africa. Sub-Saharan African exports are projected to continue growing at around 2.7% p.a. in the coming decade, with the region's market share remaining at around 15% as in the base period; South and Southeast Asia are the major export destinations.

Figure 10.7. Cotton exports in Sub-Saharan Africa
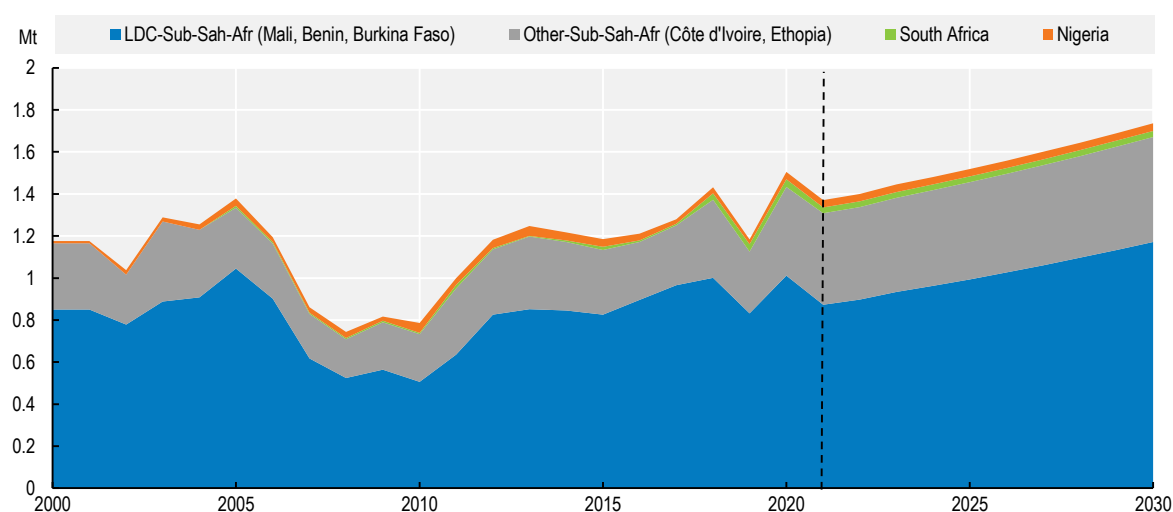
Source: OECD/FAO (2021), "OECD-FAO Agricultural Outlook OECD Agriculture statistics (database)", http://dx.doi.org/10.1787/agr-outl-data-en.

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10.1. Main issues and uncertainties

Economic growth and urbanisation will affect the per capita demand for cotton textiles in developing and emerging economies. Since the consumption of textiles and apparel is more income responsive than the consumption of food commodities, deviations from the economic conditions assumed for the developing world could lead to important changes in global consumption, production, and trade projections. Consequently, the general uncertainty of this *Outlook* on how economies will emerge from the pandemic is potentially more important for raw cotton than for other agricultural commodities.

Other demand trends could affect the projections. For example, recycling by the textile industry is creating a competitive secondary market that provides raw material to producers of lower-quality textiles and non-textile products. This trend could further reduce the demand for cotton and other fibres. However, in high-income countries there appears to be an increasing consumer preference for natural fibres that could favour cotton over polyester.

Policy measures can affect consumption trends. For example, several East African countries are increasingly discouraging second-hand clothing imports, which could give a push to cotton consumption and encourage value addition in Africa.

Like other crops, cotton production is sensitive to pests and weather conditions and projections are therefore sensitive to climate change, which could lead to increasing frequency of droughts and other adverse weather conditions. As noted above, yield growth has been slow in several countries over the past decade. Faster than expected improvements in genetics (e.g. facilitated in part by a better understanding of the cotton genome) and better pest management have the potential to lead to higher yield growth than what is projected in this *Outlook*. However, such innovations take time to develop and deploy, and in the case of genetically modified cotton are sometimes controversial. In India, pink bollworm appears to have become resistant to Bt cotton, resulting in significant crop losses. In Burkina Faso, the introduction of Bt cotton in 2008 was effective in combatting bollworms, but resulted in a shorter staple length (and hence lower quality premiums). This prompted the government to phase out Bt cotton in 2015.

Policies also play an important role in global cotton markets. This is notably the case for Chinese stockholding policies. Other policy initiatives (e.g. support for domestic textile industries, input subsidies) may affect projections. In Mexico, Bt cotton is widely planted (95% of the area), but farmers are facing seed shortages. In recent months, the Mexican Ministry of Agriculture has denied new releases of GM cotton, limiting the Bt varieties that farmers can use for planting but without giving farmers access to local conventional seeds to replace these varieties. The ministry also published a decree in December 2020 banning the use of the herbicide glyphosate in all federal government programs. Such policies add more uncertainty to the forecast of cotton production in the coming years.

Trade tensions may also play a role in affecting the development of the raw cotton markets. In recent years, the cotton market has been affected by the US-China trade dispute. In early 2021, the United States banned all products made in part or entirely from cotton produced in the Xinjiang region due to the treatment of ethnic minorities in that region. This issue is increasingly an important concern for consumers, industry, and policy makers in many countries and, depending on whether these concerns will increase or decrease in the future, could considerably alter China's export prospects of cotton-based fabrics and consequently their cotton mill demand.