Chapter 10. Cotton

This chapter describes the market situation and highlights the medium-term projections for world cotton markets for the period 2019-28. Price, production, consumption and trade developments for cotton are discussed. The chapter concludes with a discussion of important risks and uncertainties affecting world cotton markets during the coming ten years.

10.1. Market situation

Global cotton production fell by 3% to 25.8 Mt in the 2018 marketing year.[1] Declines were seen in India, the People's Republic of China (hereafter "China"), and the United States. Limited water availability, pest problems, and bad weather contributed to these output declines. Among the top producers, only Brazil expanded its output, notably in Mato Grosso where the cotton area has grown from less than 600 000 ha to an estimated 1 Mha over the last four seasons.

Global cotton consumption increased by 2% to 27.3 Mt during 2018. China remained the largest raw cotton consumer, accounting for around one-third of total spinning mill use (see below), followed by India. In recent years, strong growth of the spinning and textile industries has spurred the processing of raw cotton in Bangladesh, Turkey and Viet Nam, a trend which continued in 2018.[2]

Estimated global raw cotton ending stocks declined by 7% to 17.8 Mt, about eight months of world consumption. Changes in stocks are mostly determined by China, which currently holds 40% of global stocks but has been destocking since 2014.

Global cotton exports grew 7% to 9.5 Mt, or 37% of global production. Export growth was registered for the United States (the world's main exporter), as well as for Brazil, which is increasingly supplying cotton to South and East Asia. On the demand side, imports increased in China as well as in Viet Nam and Bangladesh; as neither of the latter two have much domestic cotton production, their growing cotton consumption is mirrored by growing imports.

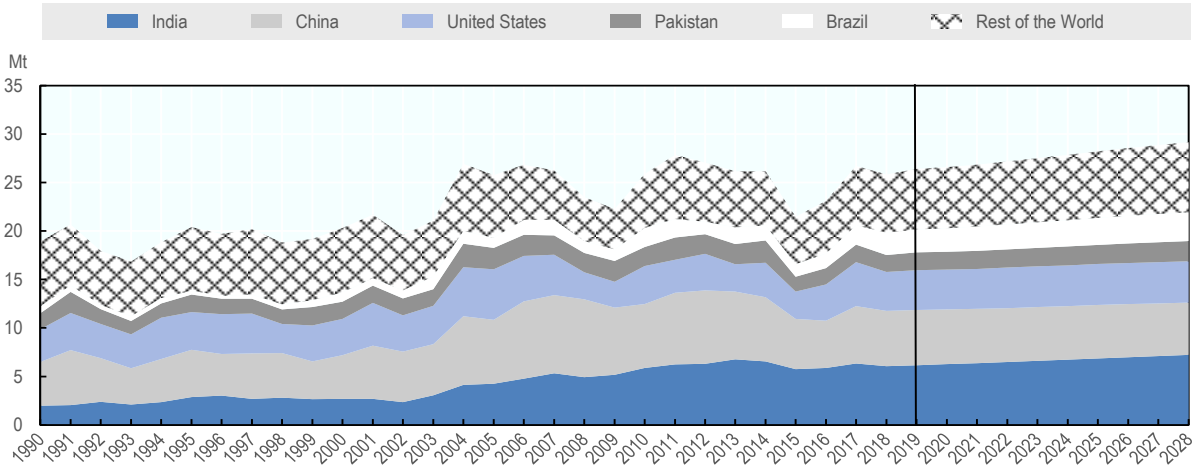
The Cotlook A index, the main reference for international cotton prices, grew from USD 1 750/t in August 2017 to almost USD 2 200/t in August 2018, but has been declining in recent months and is expected to average USD 1960/t in 2018.[3] Cotton prices continue to be historically high compared to prices of polyester, the main substitute for cotton. In 2018, polyester staple fibre prices fluctuated between USD 1 200 and USD 1 700/t.

10.2. Projection highlights

While cotton seeds are used as oilseeds, cotton is mainly grown for its fibres (also known as cotton lint), which are spun into yarn in spinning mills. These spinning mills can typically also process synthetic fibres. The yarn is subsequently woven or knitted into fabric, which is then processed into garments and other textile products. Global consumption of cotton textiles is expected to grow more slowly than world population in the coming decade, as population growth is concentrated in regions with lower per capita use of cotton textiles while per capita use itself is expected to continue to stagnate in most regions.

Consumption data in this *Outlook* refer to spinning mill use, i.e. the processing of raw cotton into yarn. The distribution of consumption across the globe thus depends on the location of spinning mills, usually in proximity to a textile industry. Over the past decades, there has been a marked shift, with spinning mill activity moving from the developed world and the former Soviet Union towards Asia, especially China. However, Chinese consumption peaked in 2007 and has been declining as stricter environmental regulations and rising labour costs have stimulated a move of the industry to other Asian countries, notably Viet Nam and Bangladesh. These trends are expected to continue over the outlook period. In India, another major cotton consumer, government policies promote a domestic textile industry which is expected to also stimulate growth in spinning mill use.

Figure 10.1. World cotton production



Source: OECD/FAO (2019), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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World production is projected to increase by +16% and reach 29.2 Mt in 2028. Growth will come mostly from an expansion of the cotton area (by 9%) while average global yields are projected to grow by 6%. Average yields have been flat since 2004, as several countries struggle with pest and water problems. Better agronomic practices (e.g. high-density planting, the use of short-duration varieties, and better canopy management) as well as better genetics and new pest management techniques could bring improvement over the coming decade, but yield growth may remain a challenge in several countries. India will remain the world's largest cotton producer, accounting for more than 65% of the expected area increase but, given its low yields, for only one-third of the increase in global production.

Global exports of raw cotton are projected to reach 12 Mt in 2028. The United States remains the world's largest exporter, accounting for 31% of global exports. In part thanks to efficient double-cropping of cotton with soybeans, Brazil is expected to emerge as a major exporter over the coming decade. Given their expected consumption growth, imports into Bangladesh and Viet Nam (the two leading importers) will continue to grow. Chinese imports are expected to be stable in the early years before falling in later years as consumption resumes its longer-term decline.

Cotton prices will remain below the average of the base period in both real and nominal terms, as competition from synthetic fibres exerts downward pressure. This Outlook assumes a decline in the real cotton price by about 23% over the first three years, bringing cotton prices closer in line with polyester.

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. This *Outlook* assumes stagnating per capita cotton consumption in these economies, in line with trends observed over the past decade, but relatively small deviations from this trend could have important repercussions for global projections. On the production side,

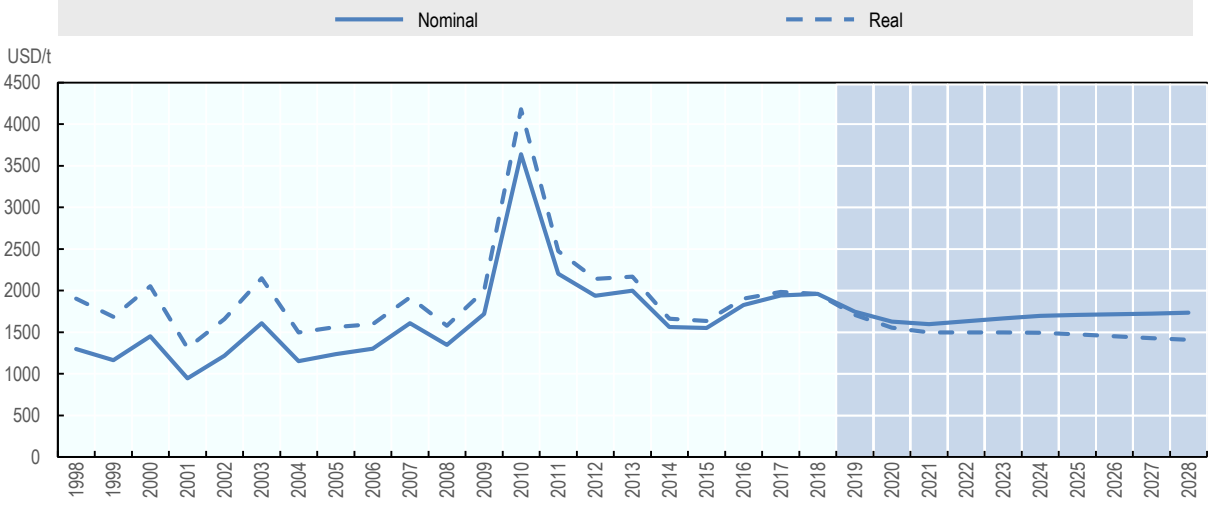
projections are sensitive to pests and weather conditions. Climate change, with its impact on the occurrence and magnitude of events such as droughts and storms, constitutes an additional factor for uncertainty in the future. Projected yield trends are also uncertain. While yield growth has been disappointing in many producing regions in the past decade, it is possible that better agronomic practices, improved genetics, and better pest management techniques will lead to stronger yield growth. Sustainability considerations will continue to influence the future demand and supply of cotton.

Policies are also a factor of uncertainty, in particular China's policy with respect to its large reserve stocks and producing countries' position on genetically modified Bt cotton as the debate on its effectiveness and impact has re-emerged in India and Burkina Faso.

10.3. Prices

International cotton prices are expected to decrease in real terms throughout the projection period, as world cotton demand remains under pressure from synthetic fibres, notably polyester (Figure 10.2). Since the early 1970s, when polyester became price-competitive with cotton, cotton prices have tended to follow polyester prices; on average, cotton prices were only 5% above polyester staple fibre prices between 1972 and 2009. Since 2009, however, cotton prices have been on average almost 40% above the polyester price. This may partly reflect changing preferences, but it seems likely to be in large part due to temporary factors, including low production in 2015-16 and Chinese stockpiling. This *Outlook* expects a partial correction, bringing cotton prices closer in line with the historical pattern. A decline of 23% in real cotton prices is expected in the first three years of the outlook period, followed by a gradual decline of 1.1% per year in real terms. (Polyester prices themselves are not part of the outlook projections, but are expected to track oil prices, which are assumed to be flat in real terms).

Figure 10.2. World cotton prices



Note: The reference cotton price is the Cotlook price A index, Middling 1 1/8", c.f.r. far Eastern ports. Data shown represent the marketing year average (August/July).
Source: OECD/FAO (2019), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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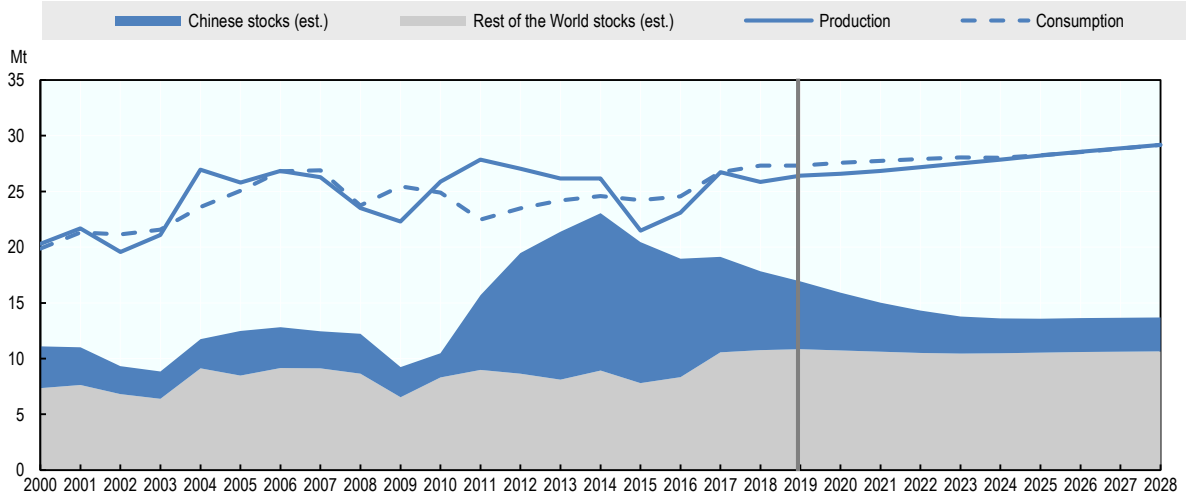
Cotton prices have historically been sensitive to demand and supply shocks, which can lead to large swings. In 2009 and 2010, cotton prices more than doubled due to a mix of low global stock levels, unexpectedly high demand, and floods in Pakistan. The subsequent correction in the cotton price was partly offset by large purchases by the Chinese National Cotton Reserve, with Chinese stocks growing to half or more of the global total in recent years (Figure 10.3).

The potential for demand or supply shocks to create volatility still exists, but a repeat of the 2009-10 price peak seems unlikely given higher global stocks outside China. However, decisions on destocking in China can affect the projections. This *Outlook* assumes that Chinese public stocks will gradually return to pre-2011 levels, in line with recent trends. The future path of cotton prices is clearly sensitive to this assumption.

Figure 10.3. World cotton production, consumption, and stocks



Source: OECD/FAO (2019), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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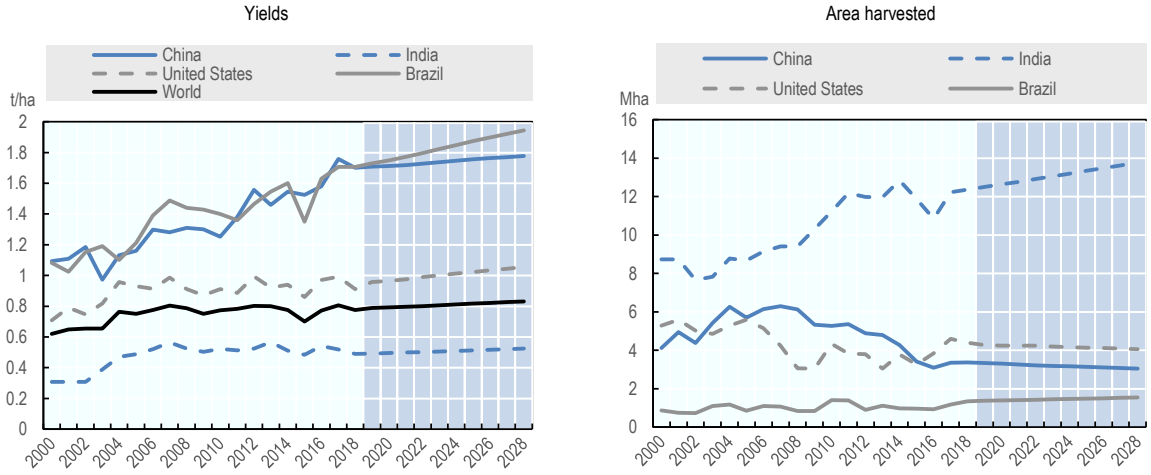
10.4. Production

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, United States, Brazil, and Pakistan. Together, these countries account for more than three-quarter 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 a quarter of the increase. At a global level, the cotton area is projected to grow by 9% while yields are only projected to increase by 6%. In the last decade, global yields were stagnant because of stagnant yields in some major producers (the United States, Pakistan, India) and because the cotton area declined in the United States and China (where yields are above-average) while it expanded in India (where yields are below-average). These two 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 10.4. Cotton yields and area harvested in major producing countries



Source: OECD/FAO (2019), "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 1.8% p.a. over the coming decade due in large part to a growing demand for cotton to supply the domestic apparel industry. After a rapid increase in yields between 2000 and 2007 (linked to an increase in irrigation, fertiliser use, and the adoption of genetically modified Bt cotton), yield growth has disappointed in recent years as producers have struggled with adverse weather and pests such as the pink bollworm, which has become resistant to Bt cotton. While it is possible that new technologies will provide relief, the development and roll-out of solutions may take several years. In addition, India's cotton yields are influenced by the monsoon pattern in rain-fed regions and are hence vulnerable to climate change. This *Outlook* therefore assumes broadly flat yields for Indian cotton, and the growing demand for cotton in India is likely to be met by an increase in the cotton area, as has been the case in the past.

Chinese cotton producers currently achieve yields per hectare which are twice the world average and, even though yields are still below potential levels, further improvement may become more difficult. The cotton area in China has been declining over the past decade mostly due to changing government policies. However, in the last two years, this decline seems to have halted. This *Outlook* expects a slowly decreasing 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 Mato Grosso. Given favourable growing conditions and a high rate of adoption of modern technologies, it seems likely that yields and area harvested will continue their upward trend of the past years.

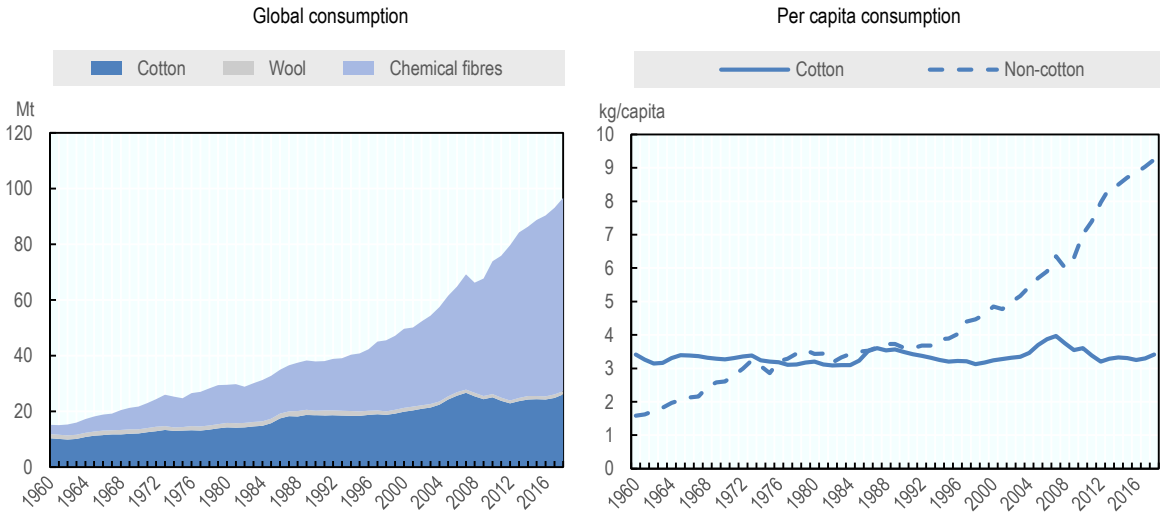
Cotton production is expected to grow at a slower pace than consumption during the first few years of the outlook period, resulting from the expected release of stocks, especially in China.

10.5. Consumption

Cotton consumption statistics in this *Outlook* refer to the use of cotton fibres by spinning mills for the production of yarn. This mill use depends on the global demand for textiles as

well as on competition of 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 chemical 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 not increased much 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 26 Mt in 2016-18.

Figure 10.5. Trends in consumption of textile fibres



Source: ICAC World Textile Demand estimates, 2018.

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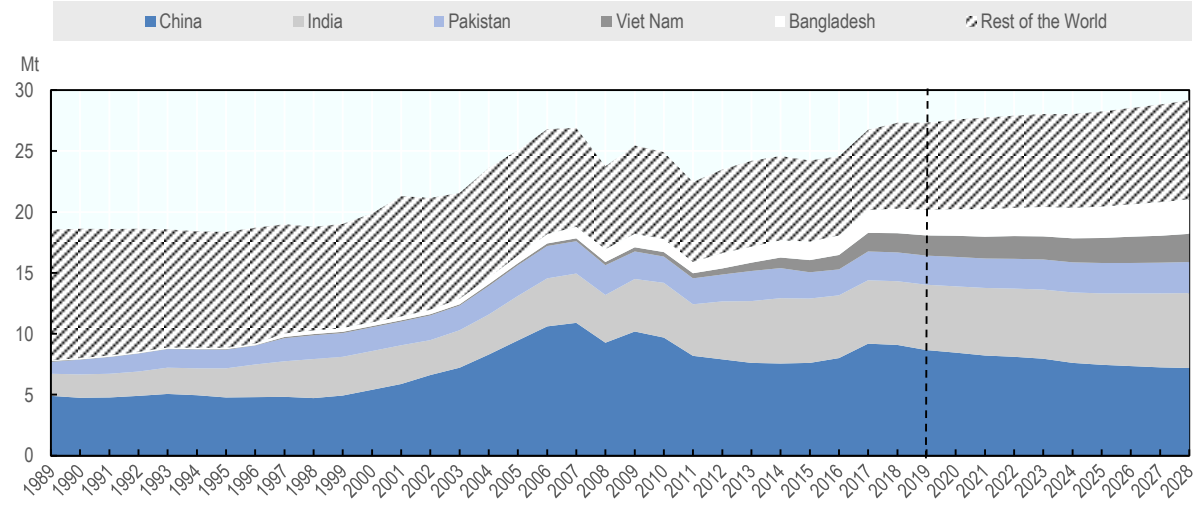
Figure 10.6. Cotton consumption by region



Source: OECD/FAO (2019), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en; historical data from ICAC.

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The prospects for global cotton depend to an important degree on how per capita consumption of cotton textiles will evolve in developing and emerging economies. Data collected by the International Cotton Advisory Committee suggests that for the developing world as a whole, per capita demand for such cotton products decreased between 2007 and 2012 and has been flat since then. It seems likely that the effects of income growth (which could lead to a higher demand for cotton products) are partly offset by strong population growth in regions where per capita demand for cotton products is below average. Because of these developments, this *Outlook* expects that global consumption of cotton products will grow more slowly than global population in the coming decade. Correspondingly, global mill use is projected to grow by around 0.7% p.a. over the outlook period.

The distribution of demand for cotton fibres depends on the location of spinning mills, where cotton and synthetic fibres are spun into yarn. These mills are mostly located in Asian countries, in part due to cheaper labour costs; China has been the world's largest consumer of cotton since the 1960s. Major shifts are taking place, however, as yarn production gradually moves from China to other Asian countries.

Consumption in China peaked in 2007, and since has fallen by 20%. This decline was partly due to a decrease in government purchases of cotton, which had provided higher prices to farmers but also induced a shift from cotton to synthetic fibres on the demand side. This decline also reflects a more structural change as higher labour costs and more stringent regulations stimulated a move of the industry to other Asian countries, notably Viet Nam and Bangladesh. In the last three years, mill consumption has regained some lost ground, in part because cotton has become more attractive compared to polyester as government interventions to prop up cotton prices have been reduced. Polyester also appears to have suffered a setback due to government measures to combat industrial pollution. Despite these factors, the strong growth of the apparel and spinning industry in lower-cost Asian countries suggests that Chinese spinning mill use will resume its declining trend over the outlook period.

By contrast, spinning mill use is expected to grow in India as the government favours the development of the domestic textile industry. Textiles form an important component of Indian industrial production and are considered an engine of employment generation. Policies are expected to continue supporting its development, e.g. through support for the adoption of faster looms.

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 to the detriment of smaller Asian countries. Instead, countries such as Bangladesh, Viet Nam and Indonesia have experienced surprisingly strong growth in their textile industry. In the case of Viet Nam, this is due in part to foreign direct investment by Chinese entrepreneurs and its accession to the World Trade Organization in 2007. The rapid growth in these countries is expected to continue over the next decade, with all three countries expanding their mill use by more than 50%. Further growth is also expected in Turkey, where the textile industry is expanding in part thanks to growing exports to the European Union and the Russian Federation.

10.6. Trade

Cotton has historically been traded in bales of raw cotton fibres, although recently trade in cotton yarn has been growing. The global trade in raw cotton (the focus in this *Outlook*) is expected to reach 12 Mt in 2028, about 30% higher than during the base period. Trade is

therefore expected to grow faster than overall consumption and production given demand growth in countries without much domestic cotton production, such as Bangladesh and Viet Nam, and declining domestic mill use in Brazil.

Bangladesh and Viet Nam are projected to be the leading importers over the next decade due to a strong growth in import volumes. By 2028, both countries are expected to increase their imports by more than 50%. Together, they will account for over 40% of global imports.

The United States will remain the world's largest exporter throughout the outlook period, accounting for almost a third of global exports in 2028. Brazilian exports are expected to grow strongly over the next decade, as Brazil emerges as the second-largest exporter by 2028.

Cotton is an important export crop for Sub-Saharan Africa, which currently accounts for 15% of global exports (with West Africa accounting for almost 75% of the region's production and shipments). Burkina Faso, Benin, Mali, and Côte d'Ivoire, the leading producing countries, have seen their volumes expanding during recent seasons due to area expansion and government support. Spinning mill consumption remains limited throughout Sub-Saharan Africa and many countries export virtually all of their production. Sub-Saharan African exports are projected to continue growing at around 2.6% p.a. in the coming decade, increasing the region's market share to 17%, with Asia and Southeast Asia being the major destinations for shipments.

10.7. Main issues and uncertainties

As discussed earlier, it is unclear how economic growth and urbanisation will affect the per capita demand for cotton textiles in developing and emerging economies. Even a relatively small deviation from the per capita demand trend for the developing world assumed in this *Outlook* could lead to important changes in global consumption, production and trade projections. In the short run, demand for textiles depends on economic conditions; a global recession could therefore lead to a drop in cotton demand.

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

Policy measures can also affect consumption trends; for instance, several East African countries are moving towards discouraging second-hand clothing imports, which could give a push to cotton consumption and encourage value addition in Africa.

Cotton production is sensitive to pests and to weather conditions. Given cotton's dependence on water, projections are sensitive to climate change, which could lead to droughts and other adverse weather conditions. As noted above, yield growth has been slow in several countries in the past decade. Improved genetics (facilitated in part by a better understanding of the cotton genome) and better pest management have the potential to lead to stronger yield growth than what is expected 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 major crop losses in Maharashtra. The causes of this problem are

currently under debate, although it seems that India's long-duration hybrid cotton varieties may contribute to the problem. 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), prompting the government to phase out Bt cotton in 2015.

Policies play an important role in global cotton markets. This is notably the case for Chinese stockholding policies, as discussed earlier. Other policy initiatives (e.g. support for domestic textile industries, input subsidies) may also affect projections.

Sustainability considerations will continue to influence the future demand and supply of cotton. Globally, an estimated 19% of cotton was produced under the sustainability standards of the Better Cotton Initiative in 2017-18, and further growth is expected. Related segments such as organic cotton are also expected to grow. One consequence of these trends is an increased need for transparency and traceability along the supply chain.

Notes

[1] In line with the convention used by the International Cotton Advisory Committee, the marketing year for cotton is defined as running from 1 August to 31 July. Data for 2018 thus refer to the period from 1 August 2018 to 31 July 2019, and are forecasts based on available data.

[2] The *Agricultural Outlook* reports data for least-developed countries in Asia as a single aggregate, which in addition to Bangladesh includes Afghanistan, Bhutan, Cambodia, East Timor, Laos, Myanmar, and Nepal. For cotton, Bangladesh accounts for nearly all the activity in this aggregate. For simplicity, this chapter therefore describes the data as referring to Bangladesh only.

[3] The Cotlook A index is expressed in US cents per pound while prices in the *Outlook* are in USD per (metric) tonne (2 204,6 pounds). Dividing prices reported here by a factor of 22 gives the price in US cents per pound.