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The ICAC Recorder

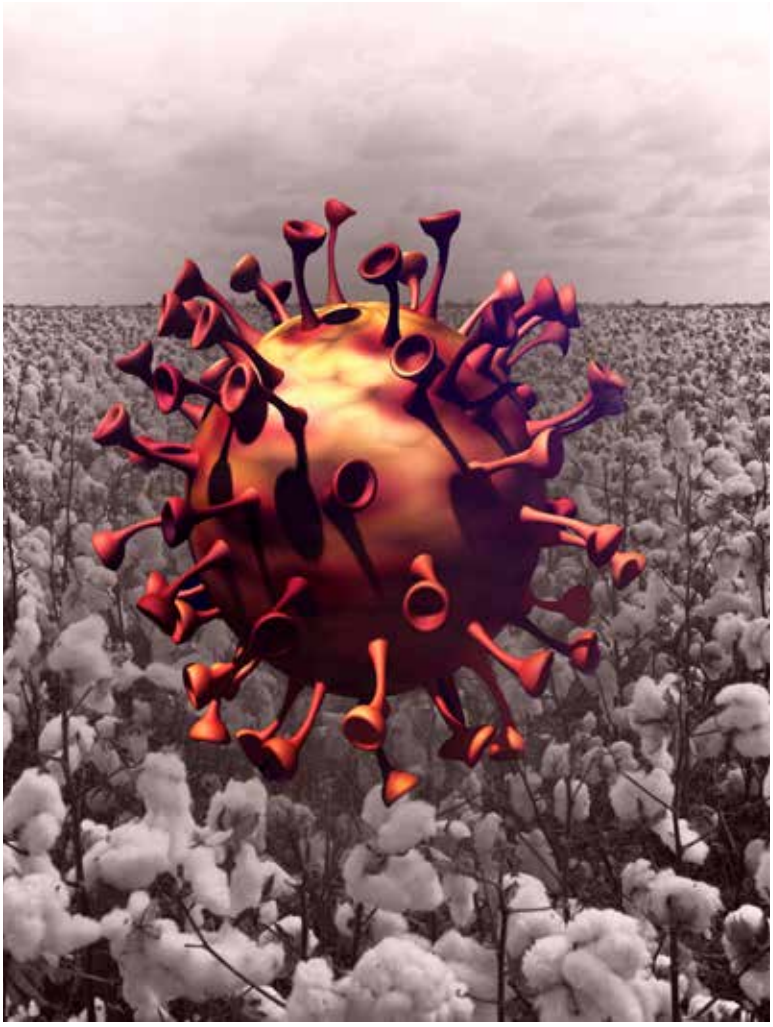
International Cotton Advisory Committee

Special Issue

POTENTIAL IMPACTS OF

COVID-19

ON THE COTTON SECTOR



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The ICAC Recorder

Editorial

We are witnessing an unbelievable event in our own lifetimes. Suddenly, within a span of a few days, the whole world has been forced into a stupor, into terror, into isolation, and the world soon became suspiciously untouchable. A tiny invisible thread packed in a small invisible protein dot has been able to create terror in the hearts of the most powerful men and nations. It posed a threat that no military could fight. It doesn't differentiate between continents, nations, borders, colour, caste, breed, creed, age or gender, but it knows precisely how to infect humans. It is present everywhere — and, pretty much like the Almighty — all pervasive. It waded its way through continents with ease and has bull-dozed the world. In short: The tiny invisible thread called 'coronavirus' has brought mankind to its knees. Is it evil? It can't be, because according to scientists, it has no life; the coronavirus is a small, lifeless 'non-living' particle.

The fundamental characteristics of life are metabolism and self-sustaining replication. Viruses do not satisfy both criteria and are therefore categorised as non-living; so, by this definition, viruses truly are dead chemical molecules. It is interesting, however, that these 'dead molecules' have developed their own design to be able to dictate lives. In fact, they have the propensity to threaten life!

But *why* do viruses interfere with life? The answer: They want to multiply by using the host cell's nucleic acids for their replication. They are parasitic in nature. Viruses are tiny threads of deoxyribonucleic acid (DNA) or ribonucleic acids (RNA). Interestingly, there is no life without DNA or RNA; but these independent DNA or RNA virus particles (virions) are considered non-living.

Viruses infect all forms of living things but they are very specific to organisms, although there sometimes are a narrow range of potential host organisms. For example, a virus that infects bats may also infects humans — but not any other forms of life such as cows, dogs, insects or bacteria. Each virus has a character of its own. Each species of virus appears to have evolved very specific mechanisms to gain entry only through specified molecular routes into organisms.

The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) gains entry only though eyes, nose or mouth — not through skin or any other route. The virus has specific receptors to which it binds to gain entry into the organism and find its way into cells and start multiplying. After multiplying, the viruses find their way back out and infect others. Only God knows how they developed such a highly evolved mechanism and ironically still be called as 'dead' chemical blobs!

Generally, RNA viruses multiply by gaining entry into cytoplasm of host cells whereas DNA viruses target the nuclei of cells. Interestingly, viruses continue to multiply in the host cells without killing the host organisms, at least until they exploit the host completely. A virus's life cycle is indeed fascinating — but can it really be called a 'life cycle' if it's a non-living particle?

SARS-CoV-2 causes the disease COVID-19. The World Health Organisation (WHO) declared it as a pandemic that could be prevented mainly by reducing human-to-human contact and by enforcing social distancing. The world responded with lockdowns, curfews, social distancing and restrictions on social life. Offices and markets were closed. Road, rail, air and water transport were halted. 'Normal life' was severely disrupted. Manufacturing, trade, and sales ground to a halt. Essential activities related to food and healthcare were exempted from the lockdown and a few governments also exempted agricultural operations. Millions of people around the world lost their employment, savings and livelihood.

The textile industry has been the worst hit. Demand for fabrics and apparel crashed, created a cascading effect on the upstream supply chains and value chains; the prices of raw cotton and yarn crashed, and stocks piled up in consuming countries. Under the current predicament of low prices for cotton and low demand for textiles, with better prices for food crops, will farmers be motivated to choose cotton over food crops? Different countries have reacted in different ways, especially depending on whether they were net importers of food or if there was government-assured support for cotton.

I invited articles from researchers across the world. Almost everyone responded with excellent analytical reports on the current status in their respective countries; staff of the ICAC, Bremen Cotton Exchange and FAO have offered their global perspectives. The articles provide a comprehensive coverage on the global impact of COVID-19 on the cotton sector.

We are chronicling our times. We are recording history. We are documenting our experiences today so some day, we will be able to recollect in posterity how we survived the pandemic — some bruised, some badly hurt and none unscathed.

-Keshav R Kranthi

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The ICAC Recorder

Covid-19 - Impact on Commodity Prices, Textile and Apparel Trade, Clothing Retail Sales and Other Factors Affecting Cotton

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The COVID-19 pandemic has not only impacted the health of millions of people worldwide, it has also generated a slew of different socioeconomic shocks. Some of these shocks include disruptions to the supply chain, declining demand, liquidity problems, capital flows, effects on trade and the global economy, and sharply declined overall consumer spending.

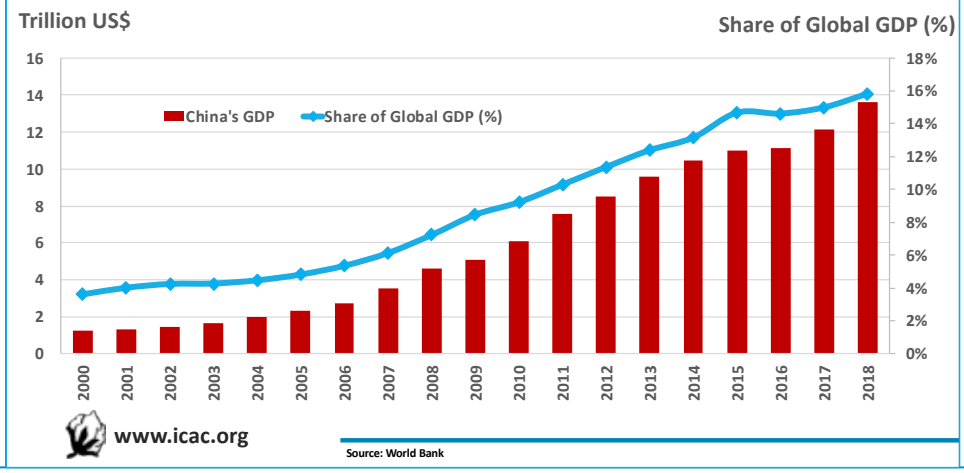
China, where the current virus originated, has faced two significant health challenges over the past two decades. According to the World Health Organization (WHO), between November 2002 and July 2003, approximately 8,100 people worldwide were affected by the Severe Acute Respiratory Syndrome (SARS). At that time, China was the sixth-largest economy and accounted for 4.3% of the global GDP (https://data.worldbank.org/) and 17.1% of world textile and apparel exports, which totalled $429.6 billion in 2003 (https://www.trademap.org/). Despite SARS, China's economy still grew by 9.15% in 2002 and 10% in 2003, with total trade expanding by 22.4% and 34.6%, respectively. SARS also had a limited effect on the global economy, which grew by 2.98% in 2002 and 4.28% in 2003.

Things have changed since then, with China's contribution to the global economy significantly larger. In 2010, the Asian giant snatched Japan's second-largest economy status and has held that position ever since. In 2018, China accounted for an estimated 16% of global output (World Bank GDP data) and 31.9% of global textile and apparel exports, which totalled $835 billion (Figures 1 and 2).

On 31 December 2019, the WHO China Office was informed that pneumonia cases of unknown origin were detected in Wuhan City, China. On 30 January 2020, the WHO declared the outbreak a Public Health Emergency of International Concern and due to rapid spreading, the coronavirus outbreak was declared a pandemic on 11 March 2020. As of 5 June, the novel coronavirus has infected more than 6.7 million people in 188 countries and killed more than 393,000 worldwide, according to Johns Hopkins University (https://coronavirus.jhu.edu/map.html).

Many countries around the world have

Fig. 1: China's Economic Growth

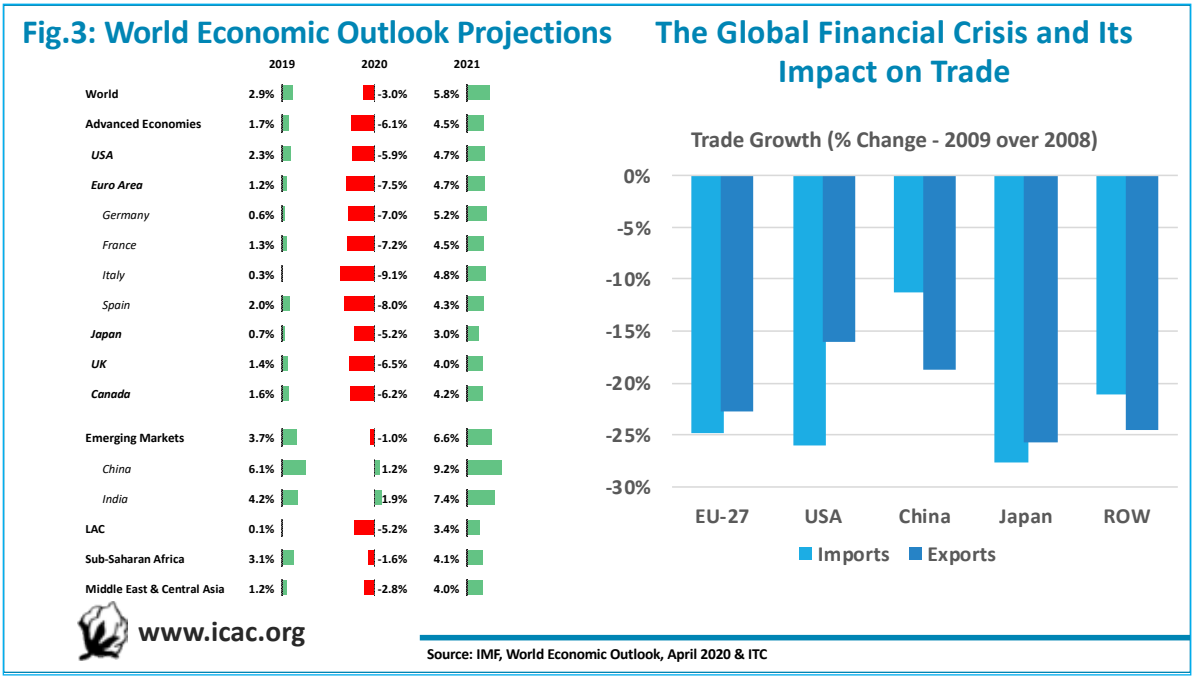


emerging markets and developing economies, where the demand for textile fibres is concentrated, the market share of developing countries in total textile fibre consumption was about 66% in 2018, are also projected to have negative growths rate of -1% in 2020 (Figure 3).

The COVID-19 pandemic will also have negative effects on global trade. According to an 8 April 2020 forecast by the World Trade Organization (WTO), 'global trade volumes are expected to fall by between 13% and 32% in 2020 as the COVID-19 pandemic disrupts normal economic activity and life around the world. The recovery for 2021 remains uncertain, with outcomes depending largely on the duration of the outbreak and the effectiveness of policy responses by countries (WTO, 2020)'. The WTO noted that the impact on global trade volumes could exceed the drop on global trade brought on by the global financial crisis of 2008/09.

The coronavirus pandemic will also have devastating consequences on the global labour market. According to the International Labour Organization (ILO), the employment impacts of COVID-19 are unprecedented. The most recent ILO estimates indicate that 'global working hours declined in the first quarter of 2020 by an estimated 4.5%, equivalent to approximately 130 million full-time jobs'. The UN agency also noted that 'global working hours in the second-quarter of 2020 are expected to be 10.5% lower,

taken decisive measures to prevent the spread of the disease. Unlike the 2008/09 financial crisis, measures to contain the virus have led to the closure of businesses and schools, deterioration in the labour market, restrictions on travel, erosion of consumer confidence and increased uncertainty about the economic outlook. According to the latest report published by the International Monetary Fund (IMF), 'the COVID-19 pandemic is inflicting high and rising human costs worldwide, and the necessary protection measures are severely impacting economic activity (IMF, 2020). The IMF reported that as a result of the pandemic, global growth is forecast to contract sharply by -3% in 2020. This is without a doubt the worst downturn since the Great Depression and worse than the 2008/09 financial crisis. Growth in advanced economies — the major consumers of textiles fibres with per-capita consumption of 32.1 kilograms in 2018 — is projected to fall by 6.1%. In



equivalent to 305 million full time jobs that their pre-crisis level in the last quarter of 2019 (ILO, 2020). ILO expects the biggest drop in working hours to be in the Americas, Europe and Central Asia. On 22 April, the ILO endorsed a call for action for the garment industry to protect garment workers' income, health and employment as well as support employers to survive during the COVID-19 crisis (ILO, 2020a). The initiative includes the International Organization of Employers (IOE), the International Trade Union Confederation (ITUC), Industrial Global Union, brands, retailers and governments.

In April, the unemployment rate in the United States — the world's largest importer of textiles and apparel, accounting for around 15.8% of the world's total T&A imports in 2019 — increased to 14.7%. The industry sectors with steepest job losses were leisure and hospitality, which lost 7.7 million jobs, and retail trade, which lost 2.1 million jobs. Nevertheless, the report released by the Bureau of Labour Statistics (BLS, 2020) on Friday, 5 June shows that the US unemployment rate declined by 1.4 percentage points to 13.3% in May. Many of the jobs came from leisure and hospitality, construction, education and health services, and retail trade. By contrast, employment in government continued to decline sharply. Employment in retail trade increased by 368,000. The main job increases were observed in:

- Clothing and clothing accessories stores (+95,000),
- Automobile dealers (+85,000), and
- General merchandise stores (+84,000).

The Eurostat of the European Union estimates that 14.08 million people were unemployed in April 2020, a month after COVID-19 containment measures began to be widely introduced by member states. The EU unemployment rate reached 6.6% in April 2020, up from 6.4% in March 2020. The unemployment rate for women was 6.8%, while the unemployment rate for men was 6.4%.

Commodity Prices

Amid the uncertainty of the current health emergency, financial markets and commodity prices have significantly dropped and registered higher volatility. The mitigation measures put in place by several countries to contain the spread of the virus have driven most commodity prices down.

In the first five months of the year, the crude oil market price (Brent Oil) has suffered a sharp contraction of 51.2%, from $63.60/barrel in January to $23.34/barrel in April, before increasing to $31.02/barrel in May. The price spike was supported by higher demand as the global lockdown measures have eased off in some countries and business activity has started to return. As stated by the World Bank (World Bank, 2020), 'the outbreak of COVID-19 has had the largest impact on the crude oil market, as two-thirds of oil is used for transport'. Even though the Organization of the Petroleum Exporting Countries (OPEC) and other oil producers reached an agreement to temporarily cut production, oil prices still remain under pressure as the world could run out of space to store all the unneeded barrels of oil.

Similarly, most metals prices have also declined. The price of gold dropped in March, possibly driven by massive liquidations across all assets to cover margin calls, but has since recovered on the back of higher financial investment demand. Gold prices increased by 9.9%, from $1,560.7/oz in January to $1,715.9/oz in May. Meanwhile, silver, copper and platinum prices have dropped as a result of lower global industrial demand. The price of silver fell by 9.5%, from $17.97/oz in January to $16.26/oz in May. Likewise, the price of copper fell by 13.1% in the same period, from $6,031.21/tonne to $5,239.8/tonne. Platinum prices plunged from $987.36/oz in January to $753.86/oz in April, the lowest price since October 2003. However, platinum prices increased to $790.2/oz in May — a two-month high — supported by a higher demand from China. According to the commodity markets outlook, published by the World Bank in April, 'metals prices are projected to decline more than 13% in 2020, before recovering in 2021, due to a slowing global demand and the shutdown of key industries'

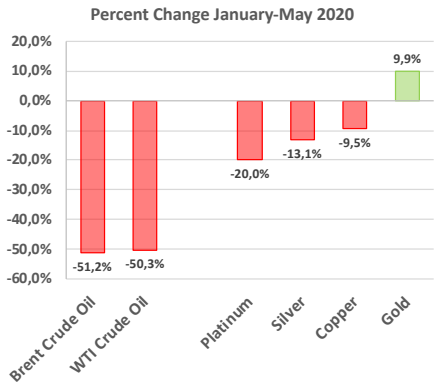
Global food supply and demand have also been negatively affected by the pandemic, with most world food commodity prices driven down for the fourth month in a row in May. Nevertheless, the World Bank forecasts that 'agricultural prices would remain broadly stable in 2020 as they are less sensitive to economic activity than industrial commodities, while production levels and stocks for most staple foods are at all-time highs'

Nevertheless, in the USA, concerns regarding the disruption of the food supply chain have increased as major processing and packing plants have been forced to shut down because massive numbers of employees got sick or are afraid of getting the disease. There is also a rapid change in consumption patterns, with more people rushing to the stores to stock up on different products, similar to the issues we saw at the beginning of the lockdown with toilet paper (Figure 4).

Trade restrictions could also impact food prices. During the global food crisis of 2007/08, the international prices of all major food commodities increased dramatically to record highs. Many countries adopted trade restrictions that limited supplies in the international food trade, contributing to increases in prices. A similar price pattern was observed in 2010/11 — adverse weather conditions coupled with trade policies such as export restrictions and relaxed imports controls in a number of countries — contributed to the surge in prices in 2010/11. Although the situation is quite different now, we must not forget that policies and actions taken by individual countries could destabilise global food markets. In developing countries, food production is labour-intensive.

Fig. 4: COVID-19 and Its Effect on Essential and Discretionary Commodities

Commodity	Unit	Average Price Jan-20	Average Price May-20	% Change
Brent Crude Oil	US$/bbl	63.60	31.02	-51.2%
WTI Crude Oil	US$/bbl	57.52	28.56	-50.3%
Platinum	US$/oz	987.4	790.2	-20.0%
Copper	US$/tonne	6,031.2	5,239.8	-13.1%
Silver	US$/oz	18.0	16.3	-9.5%
Gold	US$/oz	1,560.7	1,715.9	9.9%



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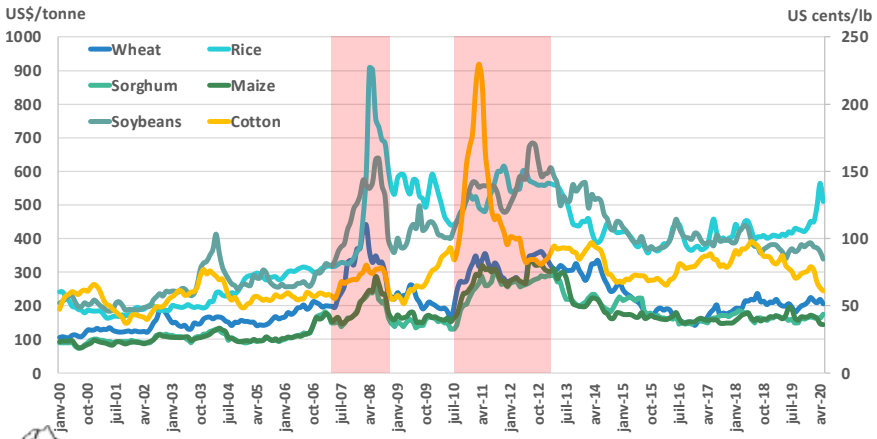
Source: World Bank, Commodity Price data (monthly prices in nominal US dollars)

Fig. 5 Agriculture Commodity Prices



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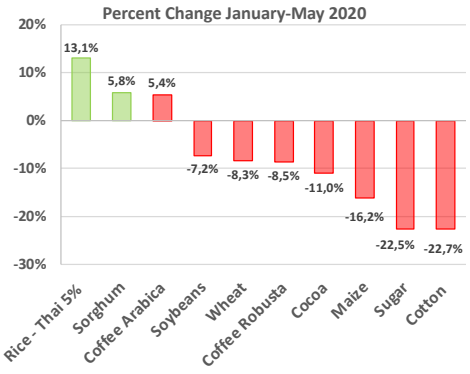
Source: World Bank, Commodity Price data (monthly prices in nominal US dollars)

Fig. 6: COVID-19 and Its Effect on Agricultural Commodity Prices

Commodity	Unit	Average Price Jan-20	Average Price May-20	% Change
Rice - Thai 5%	US$/tonne	451.0	510.0	13.1%
Sorghum	US$/tonne	166.2	175.9	5.8%
Coffee Arabica	US$/kg	3.1	3.3	5.4%
Soybeans	US$/tonne	387.2	359.2	-7.2%
Wheat	US$/tonne	224.5	205.8	-8.3%
Coffee Robusta	US$/kg	1.6	1.4	-8.5%
Cocoa	US$/kg	2.6	2.3	-11.0%
Maize	US$/tonne	171.8	143.9	-16.2%
Sugar	US$/kg	0.3	0.2	-22.5%
Cotton	US$ cents/lb	79.1	61.1	-22.7%



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Source: World Bank, Commodity Price data (monthly prices in nominal US dollars)

Activities such as sowing, harvesting and transportation could face logistical problems and increase delivery times, thus negatively affecting countries that depend on imports. Moreover, rising unemployment rates are likely to severely reduce people's purchasing power (Figure 5).

According to the latest report from the World Bank, sugar prices declined almost 22.5% since January to the second lowest level since November 2007. The fall was mainly driven by the collapse of international crude oil prices that reduced the demand for sugarcane to produce ethanol. Maize prices also dropped sharply (-16.2%), from $171.8/tonne in January to $143.9/tonne in May — the lowest level in almost 14 years. The price drop was primarily driven by a lower demand for its use in biofuel production. Wheat and soybean prices fell by 8.3% and 7.2%, respectively. Arabica and Robusta coffee prices have followed different paths in recent months. Robusta prices declined by 8.3%, from $1.6/kg in January to $1.42/kg in May. Meanwhile, Arabica prices are 5.4% higher, supported by weather disruptions and labour restrictions associated with the pandemic in Brazil, the world's largest coffee supplier and producer of Arabica coffee. Likewise, rice prices increased by 13.1% over the same period. Nevertheless, Asia rice-Thai prices dropped by almost 10% between April and May, supported by better weather conditions and stiff competition from India and Vietnam (Figure 6).

The international cotton price (measured by the Cotlook A Index), which has traded above 70 cents per pound since March 2016, has fallen below the long-term average, marked by uncertainty in demand for textiles and

apparel and global economic growth. Between January and May 2020, the Cotlook A Index contracted by 22.7%, from 79.07 cents per pound to 61.09 cents per pound. Likewise, the price of polyester — the primary fibre that competes with cotton — fell 18.8% in the same period, from 45.02 to 36.56 cents per pound. The gap between the international cotton and polyester prices in China, where 71% of world production is concentrated, narrowed from 34.05 cents per pound in January 2020 to 24.53 cents per pound in May. However, when comparing the average price of the two fibres in the first five months of the year, the gap widens to 30.74 cents per pound, the highest level since 2017.

Cotton prices will remain under pressure due to several factors, including higher ending stocks in the current and next season, weaker textile fibre demand from brands and retailers, and lower polyester prices. If the price gap between cotton and polyester continues to widen, it could reduce cotton's competitiveness and decrease its world share of textile fibre consumption. Moreover, a possible deterioration of the US-China relationship likely would result if China fails to meet the purchase commitments set in Phase 1 of the US-China trade deal (Figures 7 and 8).

Textiles and Apparel Trade

Until 2005, a series of multilateral agreements limited Chinese textile and apparel exports: the Multifibre Agreement (MFA, until 1995), and later, the Agreement on Textiles and Clothing (ATC). Between 2001 and 2005, China increased the value of its textile and apparel exports by 116%, from $49.8 billion to $107.7 billion. Its share of total exports worldwide also rose from 13.8% to 21.1%.

Following the 2008/09 global financial crisis, the value of world textile and apparel exports fell 14.2% to $559.1 billion in 2009. However, the value quickly recovered to $643.9 billion (+15%) in 2010. China's market share grew each year, reaching a 35.5% share in 2015 — the highest level so far — before declining to 31.4% in 2019.

The European Union (EU-27), the United States, and Japan remained the top three largest importers of textile and apparel products by value, accounting for around 57% of the world's total textile and apparel imports in 2019. While China, the EU-27 and Bangladesh remained the top three largest exporters of textile and apparel products by value, accounting for 62.3% of the world total in 2019 (Figures 9 and 10).

The latest statistics from the Chinese General Administration of Customs show the negative impact of COVID-19 on the Chinese textile and apparel trade. In the first four months of 2020, the value of textile and apparel exports was $65.7 billion, a drop of 10.2% from the previous year. Imports decreased by 9.2% to $10.1 billion. The same trend is observed in China's total exports, which decreased by 9% from a year ago. Total exports reached $678.22 billion, while imports decreased by 6.0% for a total of $619.96 billion. It is worth noting that between January and April, China's import value of other made-up textile articles (HS code 63), which includes surgical masks and disposable face masks made of non-woven textiles, increased to $1.01 billion, a growth of 605.4% YoY (Figure 11).

The Bangladesh Export Promotion Bureau (http://www.epb.gov.bd/) reported that the country's apparel exports fell by 25.9% in the first four

Fig. 7: Cotton and Polyester Prices

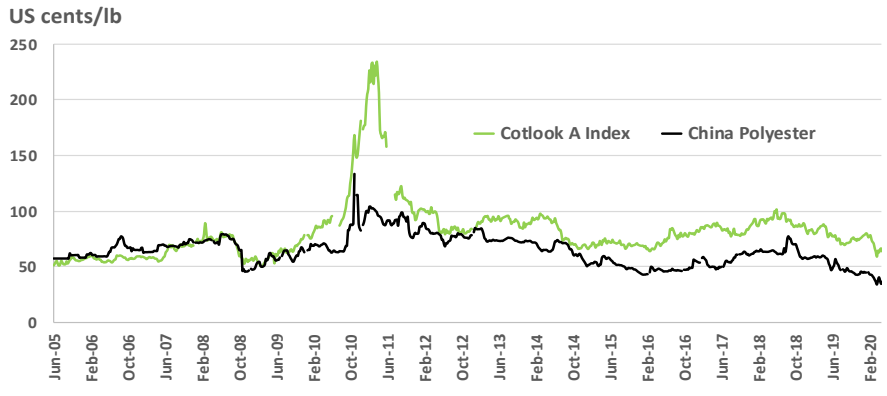


Fig. 8: Price Gap Between Cotton and Polyester

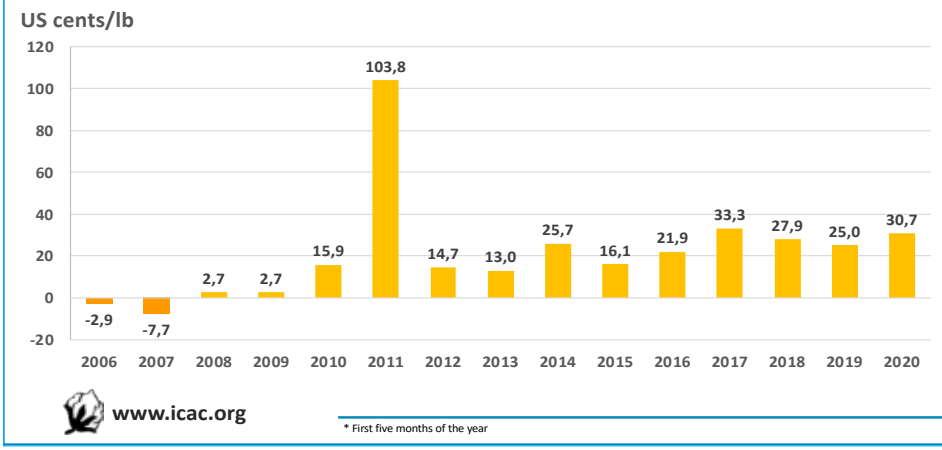
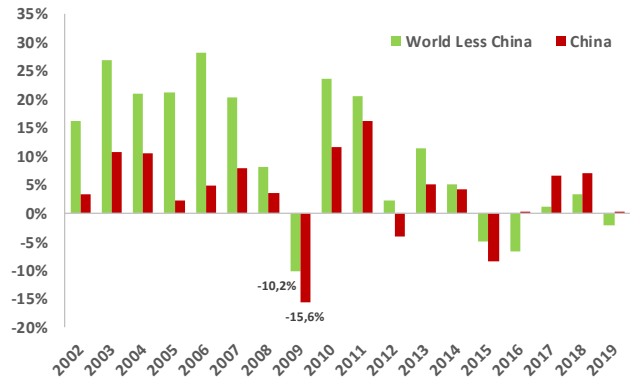


Fig. 9: Textile and Apparel Exports

Year on year percentage change



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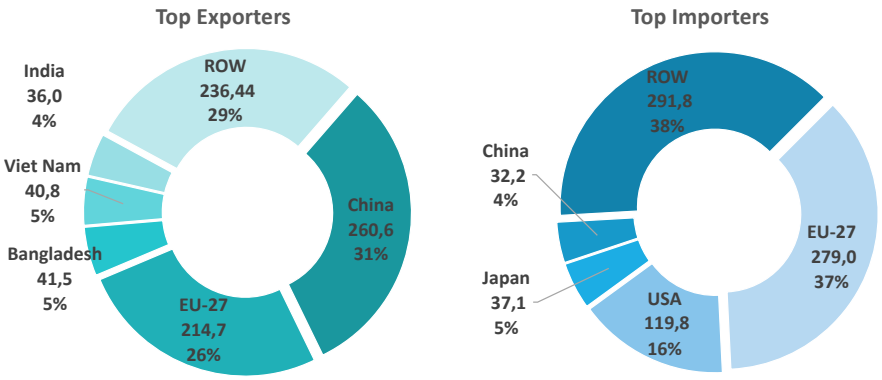
Source: ITC

Fig. 10: Textile and Apparel Trade – 2019

Billion US$



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Source: ITC

Fig. 11: China Textile and Apparel Trade: January & April - 2020

HS Section	Jan-April Exports US$ Billion	% Change Y-o-Y	Jan-April Imports US$ Billion	% Change Y-o-Y
TOTAL	**678.22**	**-9.00**	**619.96**	**-6.00**
Textiles and Textiles Articles	**65.67**	**-10.20**	**10.10**	**-9.20**
50 Silk	0.19	-19.3	0.01	-9.2
51 Wool	0.43	-31.3	0.55	-34.4
52 Cotton	2.60	-31.8	2.31	-20.1
53 Other vegetable textile fibres	0.32	-18.5	0.23	-15.0
54 Man-made filaments	4.38	-20.6	0.54	-21.4
55 Man-made staple fibres	2.50	-20.4	0.43	-21.3
56 Wadding, felt and nonwovens	1.29	-0.4	0.30	15.7
57 Carpets and other textile floor coverings	0.51	-17.7	0.02	-34.7
58 Special woven fabrics	0.86	-36.1	0.08	-28.7
59 Impregnated, coated, covered or laminated textile fabrics	1.58	-14.6	0.34	-16.2
60 Knitted or crocheted fabrics	3.20	-19.6	0.23	-27.7
61 Articles of apparel and clothing accessories,knitted or crocheted	10.86	-23.5	0.72	-18.6
62 Articles of apparel and clothing accessories, not knitted or crocheted	10.47	-22.6	1.13	2.6
63 Other made up textile articles	5.51	86.0	1.01	605.4

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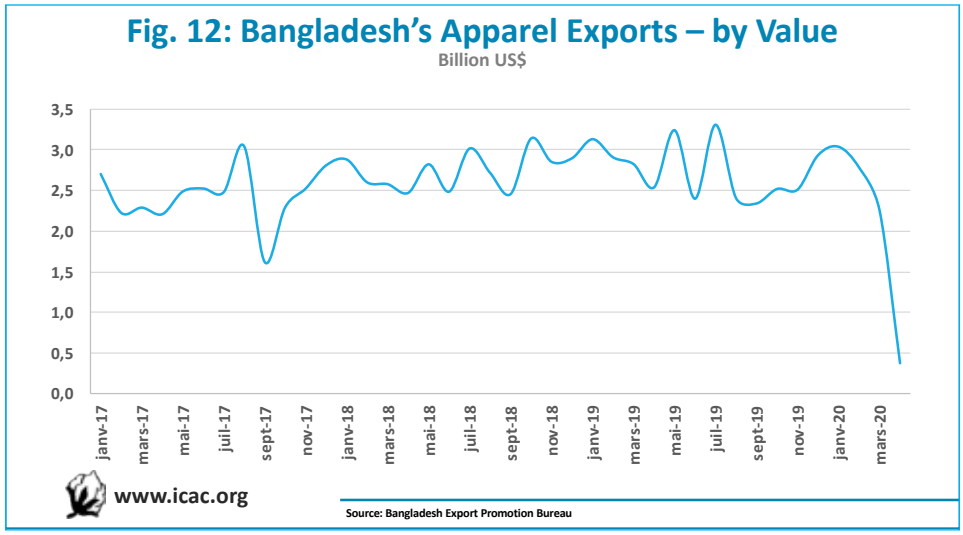
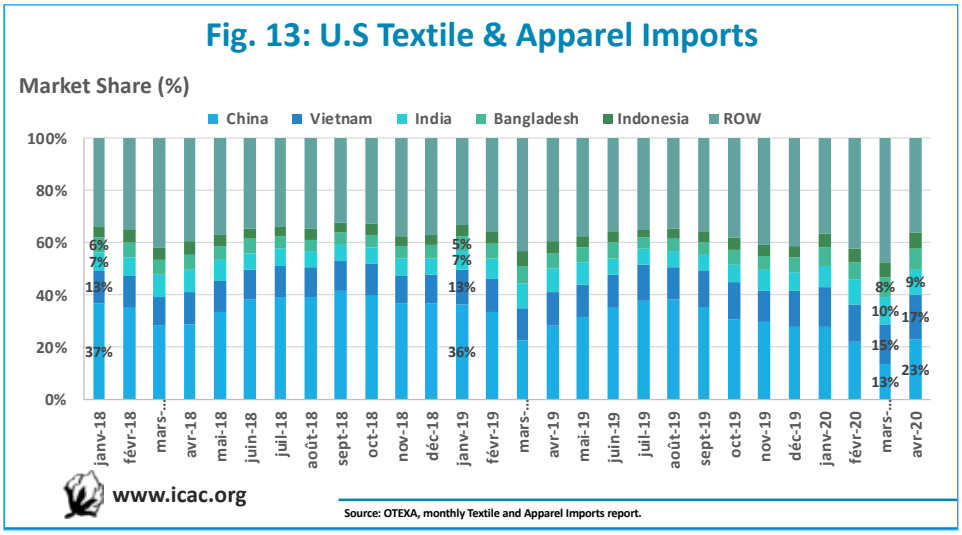
Source: China Customs

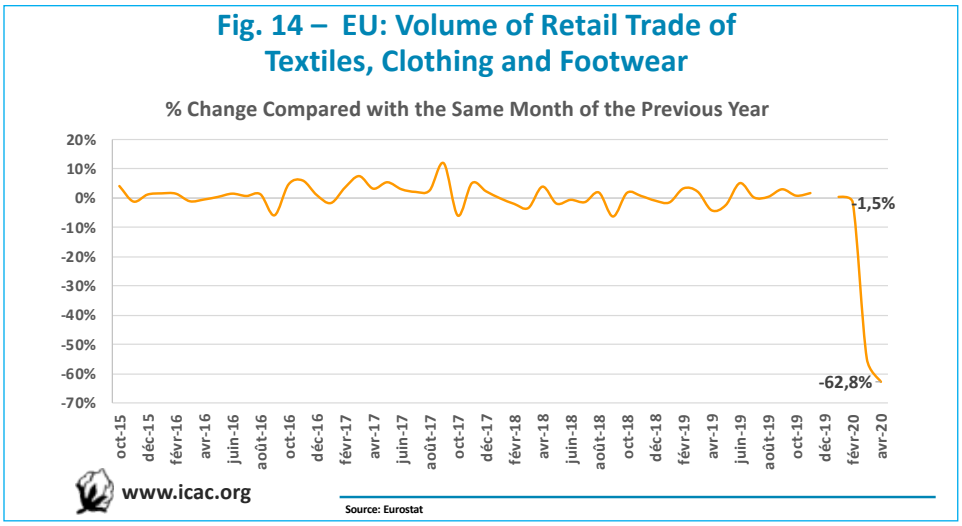
months of 2020 compared to the same period in 2019. The value of RMG exports fell from U$11.4 billion from Jan-April 2019 to $8.45 billion in 2020. Likewise, apparel exports in April 2020 fell by 83% to $375 million from $2.26 billion in March. The steep decline was due to a slow demand in major destination markets, such as the United States and Europe, and the temporary factory closures implemented in the country for nearly a month to curb the coronavirus pandemic (Figure 12).

In Vietnam, provisional data from customs show that the country's textile and garment exports totalled $8.65 billion in the first four months of 2020, down 8.8% year-on-year. The export markets with the steepest decline in value terms were the US (-$465 million), Korea (-$77 million), China (-$61.7 million) and the UK ($50.6 million).

In the United States, the value of textile and apparel imports contracted for a fourth consecutive month in 2020. T&A imports decreased by 18.1% in the first four months of 2020 compared with a year ago. This decrease is worse than the one observed during the global financial crisis when the value of US T&A imports fell by 13%. According to the Office of Textiles and Apparel (OTEXA https://otexa.trade.gov/), the value of textile and apparel imports from China dropped by 41.4% from January and April compared to the same period the previous year. As a result, China's market share also decreased from an average of 36.6% in 2018, to 32.8% in 2019, to 21.9% so far in 2020. However, it is worth noting that there was already a downward trend since September 2019, given the trade dispute between both countries.







Other Asian countries took advantage of China's market loss, including Vietnam, India, Bangladesh and Indonesia. The value of their textile and apparel exports to the United States in the first four months of 2020 increased by 15% in Vietnam, 9% in India, 7% in Bangladesh and 5% in Indonesia, compared with a year ago (Figure 13).

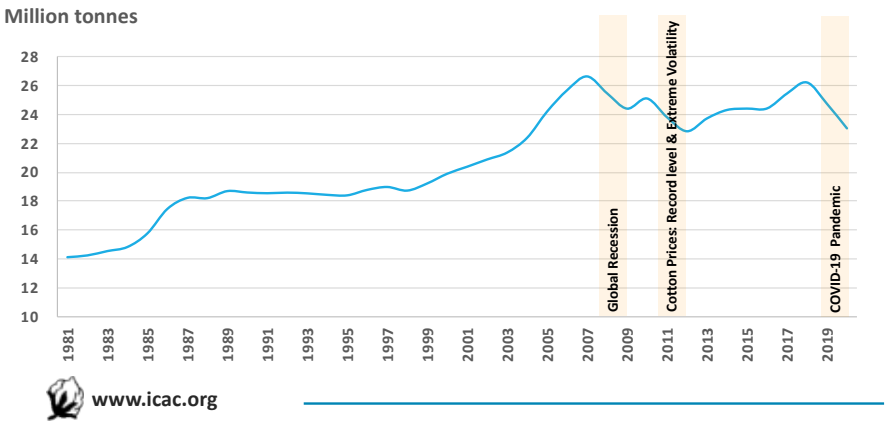
Japan, the third-largest textile and apparel importer in the world, also reduced its T&A imports in the first quarter of 2020. The total value of textile and apparel imports dropped by 9.6% compared to the same period the previous year. Imports from China and Indonesia decreased by 17% and 8%, respectively. While imports from Vietnam, Bangladesh and Cambodia increased by 6%, 3.7% and 0.5%, respectively. China's market share decreased from an average of 55% in Q1 2019 to 50% in Q1 2020.

According to latest estimates from Eurostat, the COVID-19 containment measures widely introduced by member states had a significant impact on retail trade. The volume of retail trade for textiles, clothing and footwear in the EU-27 decreased by 54.9% in March and by 62.8% in April, compared to the same months of the previous year. The latest report shows that the EU's volume of retail trade decreased by 18% in April, compared to the same month of the previous year. Amongst member states for which data are available, the largest annual decreases in the total retail trade volume were registered in France (-31.1%), Spain (-29.8%), Malta (-24.8%) and Luxembourg (-24.7%) (Eurostat News Release 4 June 2020) (Figure 14).

A preliminary report from to the European Apparel and Textile Confederation (EURATEX) shows that short-term prospects for the textile and clothing industry are expected to be dramatic. According to the survey of European textile and clothing companies conducted in April, 60% of textile and clothing companies expect sales to drop by half, while 30%

of companies expect a reduction as high as 80%. The report also mentioned that 70% of companies have serious financial constraints and 80% of the sample has reduced workforce, using temporary unemployment schemes where available. Production companies reported problems in their supply chains, whereas retailers face the problem of a 'lost Summer season'. Despite this critical situation, EURATEX informed that 'over 500 companies reconverted part of their sites or invested in new machineries, to produce protective masks and garments to overcome the crisis'.

Fig. 15: World Cotton Mill Use



It goes without saying that the rapid spread of the coronavirus and the uncertainty of its impact on the world economy have brought new challenges not only for the cotton sector but for the textile and apparel industry. It has also caused brands and retailers to postpone or cancel purchase orders, thus affecting factory employment and liquidity, especially in cotton-consuming countries in Asia. Even though various countries have announced stimulus programs, reduced interest rates and offered financial assistance packages to mitigate the health crisis and limit economic damage, there is no clear consensus on how fast the global economy will bounce back. The abrupt cessation of economic activity — which involves the closure of many stores and malls, an increase of layoffs, a rising unemployment rates, and the expected lower demand for apparel consumption in major markets, such as the United States, EU and Japan — makes the current situation unprecedented. While the United States and the European companies are likely re-evaluating their global supply chains, it remains to be seen how extensive and rapid the reshoring will be. Moreover, the pandemic has fuelled a trend toward protectionism — it hasn't been mentioned by the US government alone. In Japan, the government presented an economic stimulus package of $2.2 billion to move companies away from China and relocate production back to Japan or other ASEAN countries. In France, the Finance Minister instructed French manufacturers to assess their supply chains and the over-dependence on suppliers from China and other Asian countries (Figure 15).

In the past two decades, world cotton mill use has suffered through three negative shocks:

1. The 2008/09 financial crisis
2. Record high prices and extreme volatility between 2010-2012, and
3. The coronavirus disease (COVID-19) pandemic

During the financial crisis, cotton consumption decreased by 8.4%, as world cotton demand plummeted from 26.6 million tonnes in 2007 to 24.4 million tonnes in 2009. Although cotton consumption recovered the following year to 25.1 million tonnes (+2.9%), it was again impacted by high volatility and record-high prices in 2011-2012. Cotton demand was negatively affected, and mill use plunged to 22.8 million tonnes in 2012 – the lowest level since 2004. Nevertheless, cotton consumption slowly recovered until it reached 26.3 million tonnes in 2018 – the second-highest level in almost 60 years. The total impact of the pandemic on the cotton industry will depend on how long this health crisis lasts, the containment measures taken to prevent the spread of the disease, and on consumers' behaviour and spending patterns. Certainly, the trend in cotton prices will be determined by fundamental market conditions, which in turn would depend on how rapid and intense the recovery of consumer demand will be.

Clothing Retail Sales

The apparel brands' demand for fabrics depends on the level of revenues they generate by selling their products. With the closure of retail stores as a part of the lockdown measures, apparel brands have lost their major source of making sales.

A Forbes article (Forbes, 2020) noted that the foot traffic to U.S. stores fell 58.4% in the third week of March. If the retail shutdown is prolonged, those with the bulk of their inventory trapped in stores and without a strong balance sheet may find that they are economically unable to continue operations. As per the advance estimates of April by the United States Census Bureau (USCB, 2020), retail sales of clothing and clothing accessories in the US fell by 78.8% (m-o-m) to reach $2.3 billion between March and April 2020 and a total of 89.4% fall since January 2020 (Figure 16).

The retail sales of men's clothing stores fell by 56.2% and women's clothing stores fell by 53.8% between Feb and

Fig. 16: Retail Sales of Clothing and Clothing Accessories Stores in the U.S

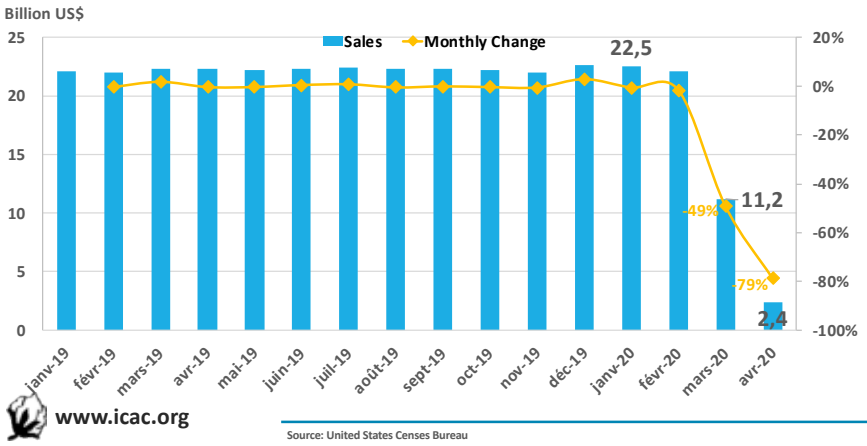
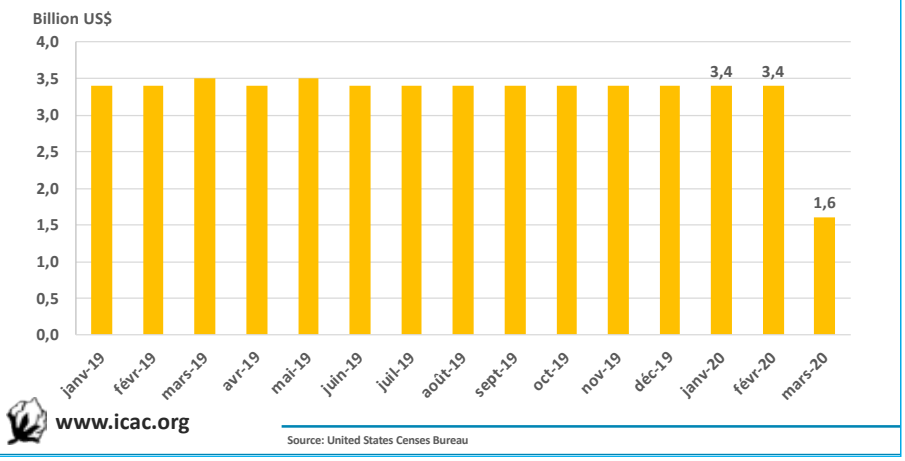


Fig. 17: Retail Sales: Men's Clothing Stores

Fig. 18: Retail Sales: Women's Clothing Stores



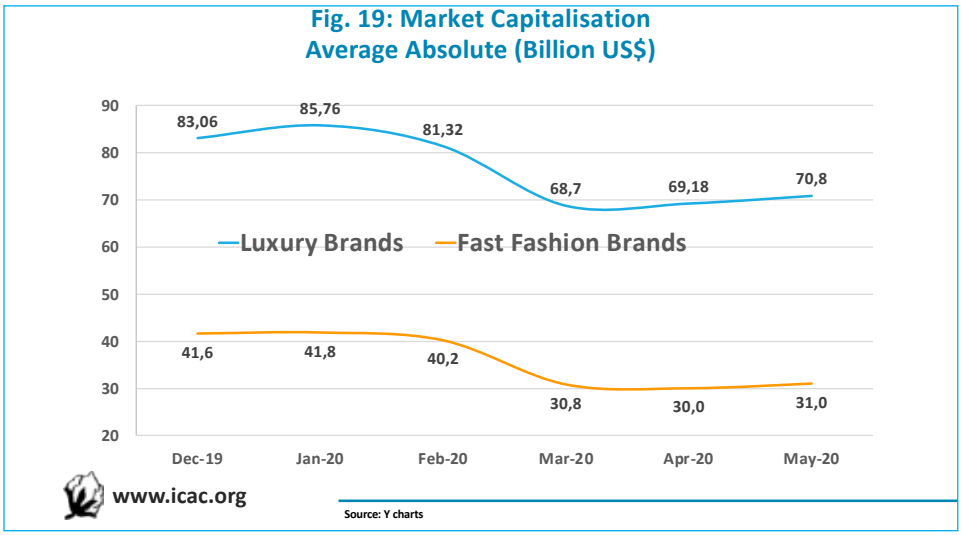
March 2020. No advance estimates were announced for clothing, and jewellery stores individually, but the available U.S. retail sales data on clothing stores showed declining trends in their sales in January and February 2020. With wider shutdowns implemented in the month of March 2020, the trends are expected to decline further (Figures 17 and 18).

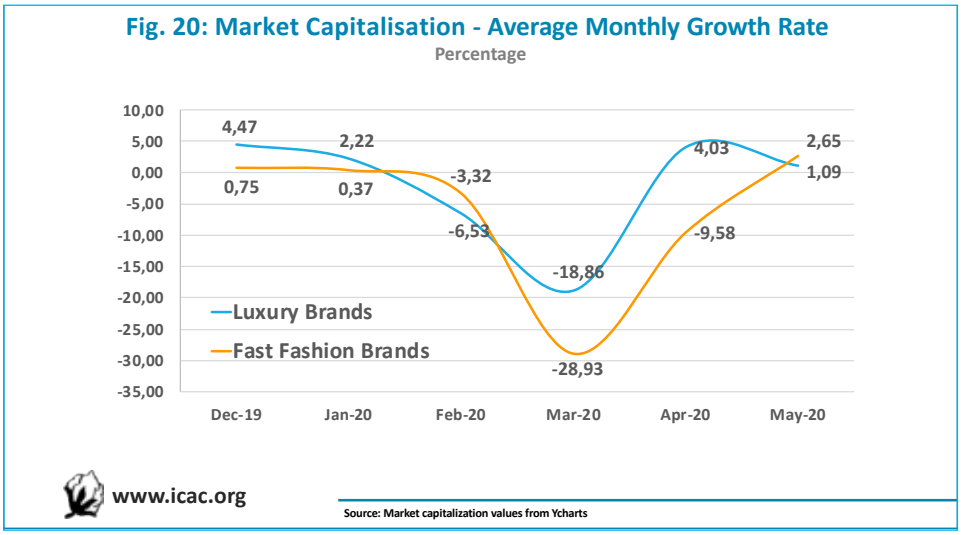
In the US, the monthly growth rate in retail sales of clothing and clothing accessories stores (month over month) showed a declining trend starting in January 2020. After the advance estimates of retail sales for the month of April by the United States Census Bureau, this monthly growth rate fell to 78.8% in April.

These show significant slowdowns in the earnings from the retail sales for the clothing and clothing accessories stores in U.S. markets. With the lockdown in place, McKinsey & Company (McKinsey, 2020) has estimated that the revenues for the global fashion industry (apparel and footwear sectors) will contract by 27 to 30% in 2020 year-on-year. While the revenue figures for apparel brands will be released in the quarterly assessments, these brands have been losing market value in the U.S. stock market since the outbreak of the COVID-19 pandemic. In order to analyse this loss in market value by clothing brands, daily figures of market capitalisation are considered to provide an average for a month, to calculate a month-to-month market capitalisation performance of the clothing brands since the outbreak of COVID-19.

Market Value of Clothing Brands

As per the Business of Fashion (McKinsey, 2020a), the average market capitalisation of apparel, fashion and luxury players dropped almost 40% between the start of January and March 24, 2020 — a much steeper decline than that of the overall stock markets (Figure 19).





In order to study the impact of the COVID-19-induced lockdown measures on apparel brand market capitalisation (Y Charts, 2020) in U.S. markets, a sample size of five fast-fashion brands and five luxury brands from U.S. stock markets were analysed to see if they have lost any market value since the outbreak of the global pandemic. All the brands chosen deal in clothing and clothing accessories sales, amongst other categories, in the U.S. markets.

All five luxury brands chosen had lost significant market capitalisations in the month of March. Prada lost its market capitalisation between Feb-Mar 2020 by 19.6%, Louis Vuitton by 15%, Christian Dior by 18.6%, Burberry by 30% and Hermes by 9.6%. Amongst the fast fashion brands; H&M lost market capitalisation between Feb-March 2020 by 31.7%, Inditex by 22.7%, Gap by 41.7%, Fast Retailing (owns UNIQLO) by 16.6% and American Eagle by 31.8%. The average decline by value in the market capitalization of the luxury brands' sample from Feb-Mar 2020 is $12.6 billion, while that of the fast fashion brands' sample is by $9.4 billion, indicating that the fall in value terms was stronger for luxury brands than for fast fashion brands. While the average of the luxury brands sample has already started regaining market value, increasing from $68.7 to $70.8 billion, the fast-fashion brands have had a slow increase from $30.8 to $31 billion between March and May 2020 (Figure 20).

Looking at the average monthly growth rate of market capitalisation (month over month) of these brands, it shows that fast-fashion brands decreased more than the luxury brands from Feb-Mar 2020. Brands like H&M, Gap and American Eagle lost more than 30% of their market value individually between Feb-March 2020, bringing down the entire average growth rate of the fast-fashion brands' sample to -23% in March 2020 — almost 8 percentage points less than the luxury brands' sample.

Future Expectations

After the lockdown, the world markets might open to an economic slowdown or a possible recession. This will reduce consumer spending and purchasing power. According to the consumer concern surveys conducted by Cotton Incorporated (Cotton Inc., 2020) in the U.S., China and Mexico, it was found that the consumers are already spending less under the current scenario. Further, the second survey showed a spike in the number of consumers who are spending less during the pandemic. Moreover, under the current scenario, consumers are prioritising their spending on necessities and essential goods rather than discretionary and non-essential goods (Figure 21).

If the market opens to an economic slowdown, clothing — being a discretionary commodity — will have positive income elasticity, meaning any fall in the income of the consumer will lead to a fall in the demand for clothing. While this is true for both luxury and fast fashion brands, the intensity may differ due to the variable income elasticity of their consumer base (Figure 22).

Because fast fashion brands cater to more income- and price-sensitive consumers, it is expected that consumers of fast fashion brands will take longer to return to stores. The state of fashion report (Business of Fashion, 2020) also

Fig. 21: Situations that will be Faced by Both Fast Fashion and Luxury Brands

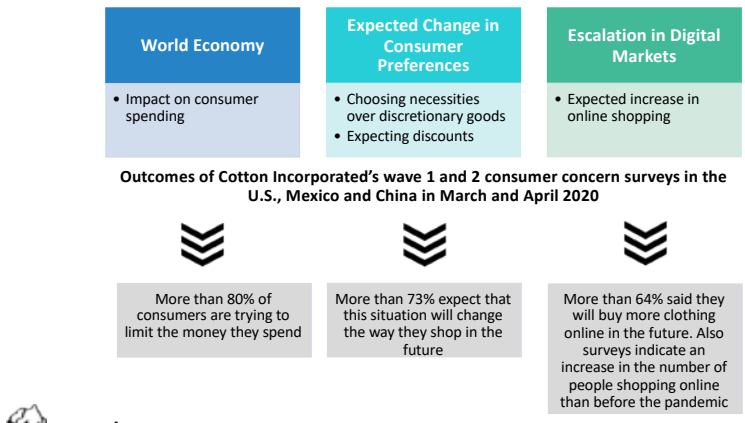
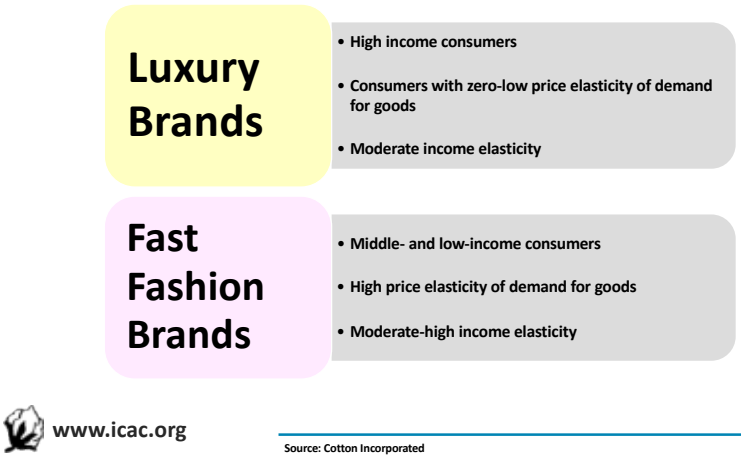


Fig. 22: Consumer Base Served by Luxury and Fast Fashion Brands



stated that, 'mid-market brands and retailers will be hit hardest, as cash-strapped shoppers likely will shift down to the value segment for essentials, and middle-class consumers likely will opt for heavily discounted, affordable luxury and premium goods. In the luxury segment, the authors expect that consumers will return more quickly to paying full price for quality, timeless goods, as was the case after the 2008/09 financial crisis.'

Generally speaking, today's unprecedented containment measures are forcing consumers to change their lifestyle preferences and purchasing behaviours. Forbes (Forbes, 2020a) has also revealed that the consumers could emerge from the pandemic with entirely new brand preferences or lower overall brand loyalty. It added that the consumers would have adopted short- term behaviours during the pandemic that in many cases will become permanent.

Exchange Rates

World trade in commodities is largely affected by prevailing exchange rates. Falling exchange rates are indicative of a loosening economic grip and poor performance of the markets. The current fall in the exchange rates define the slowing of the world economy due to the COVID-19 pandemic.

While a strong US dollar benefits some countries, it negatively impacts others. When analysing the exchange rate between two currencies, the depreciation or weakening of one currency must mean the appreciation or strengthening of the other. Although the United States is under lockdown and the number of coronavirus cases is still on the rise, the American dollar continues to be viewed as the world's safest and most stable currency. Nevertheless, a strong dollar makes US exports more expensive, which means US products are less competitive than foreign-made goods. A stronger dollar also means Americans can benefit from less expensive foreign travel and cheaper import goods, leaving more disposable income for consumers.

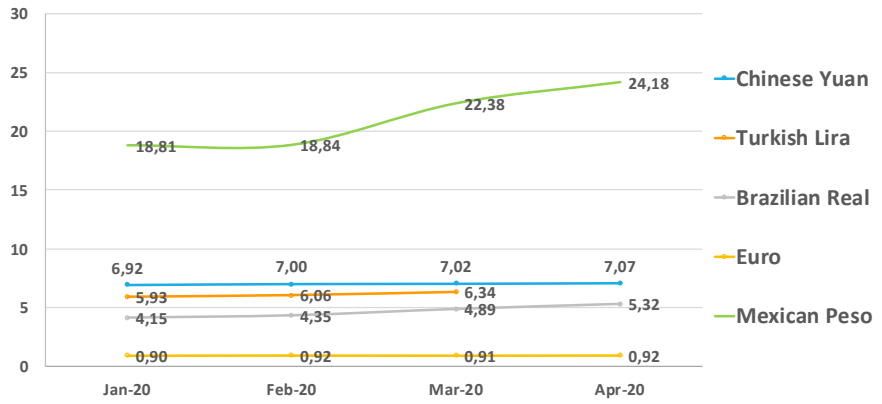
Peterson Institute for International Economics (Peterson Institute, 2020) stated that 'with the notable exception of the UK pound, which may have been influenced by the Brexit outlook, other reserve currencies have moved little against the US dollar. Countries with external debts that exceed their foreign exchange reserves have seen large declines in their currencies. The countries without large external debts that experienced sharp depreciations in 2020 are all major energy exporters, such as Canada, Australia and Russia.'

Looking at the impact of COVID-19 on the exchange rates of major cotton-consuming and -producing countries, almost all of them have lost value against the US dollar. The Chinese yuan depreciated by 2.6% from 6.9 to 7.1 yuan per U.S. dollar between Jan-May 2020. Likewise, the Turkish lira suffered a depreciation of 17%, from TL5.92 to TL6.93 per US dollar, over the same period. In India, the world's largest cotton consumer and second-largest consumer, the rupee has depreciated by 6.2%, from ₹71.3 to ₹75.7 per US dollar between Jan-May 2020. The Pakistani rupee depreciated by 3.7%, from PKR154.7 to PKR160.5 per US dollar. Amongst Latin American countries, the Brazilian

real has fallen by 36.3% against the US dollar, amid worries over a deep economic recession due to the coronavirus pandemic. Brazil's real fell from R$4.15 in January to R$5.65 per US dollar in May. The Mexican peso depreciated by 24.8 % between Jan and May 2020, from MXN18.8 to MXN23.46 per U.S. dollar. Similarly, the euro has lost around 2% of its value against the U.S. dollar over the same period. Japanese yen has traded comparatively well against the US dollar even with the outbreak of the COVID-19 pandemic, gaining 1.9% from 109.3 to 107.2 yen per U.S. dollar in the same period (Figures 23 and 24).

The monthly percentage change in the yuan, lira, and real per US dollar have been positive, indicating that they have depreciated against the US dollar in the last month. Amongst these, the Brazilian real witnessed the greatest fall in its value against the US dollar since the COVID-19 outbreak. Similar to the financial crisis of 2008/09, the dollar has emerged as the preferred currency by investors, reinforcing its great influence on the world economy (Figure 25).

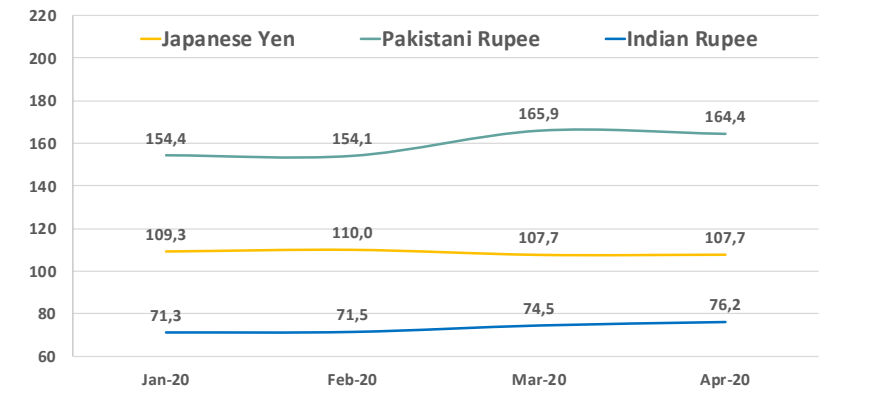
Fig. 23: National Currency / U.S. Dollar



www.icac.org

Source: Federal Reserve Economic Data

Fig. 24: National Currency / U.S. Dollar

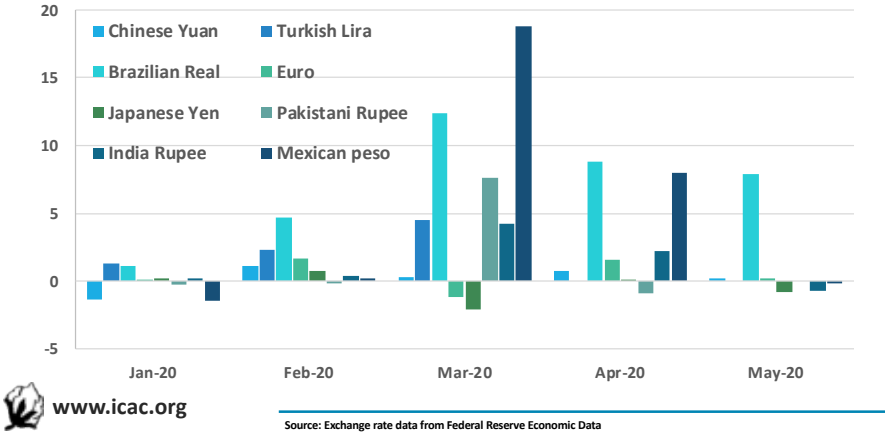


www.icac.org

Source: Federal Reserve Economic Data, for Pakistan: State Bank of Pakistan

Fig. 25: Exchange Rates

Percentage Change



www.icac.org

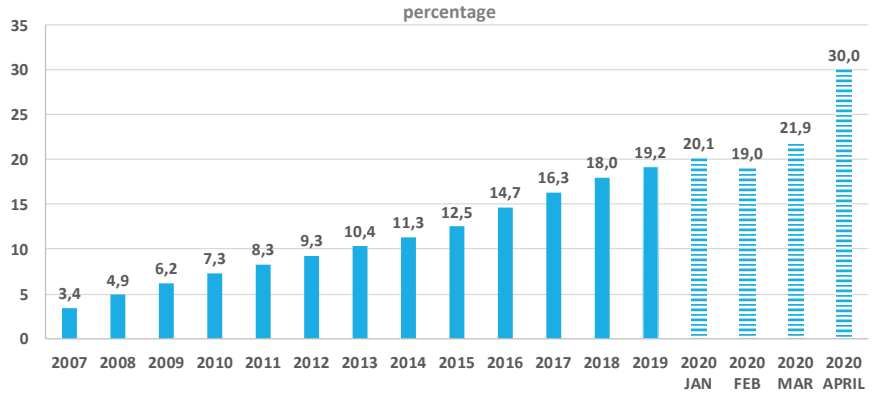
Source: Exchange rate data from Federal Reserve Economic Data

Online Sales

The great lockdown due to the spread of COVID-19 led to the closure of retail stores, restaurants, bars and all other forms of public places and non-essential business places across the globe. Even the essentials — grocery stores and pharmacies — have become vulnerable places for contamination. In this scenario, the diversion of consumers toward online shopping would be an expected outcome.

Addressing the concern of getting infected by receiving a delivery package (from online shopping), the Centers for Disease Control and Prevention (CDC, 2020) had remarked that the poor survivability of the coronavirus on surfaces makes it unlikely someone would get infected from food products or packaging that is shipped over a period of days

Fig. 26: U.K's Internet Sales as a Percentage of Total Retail Sales 2007-2020 (Jan-April)



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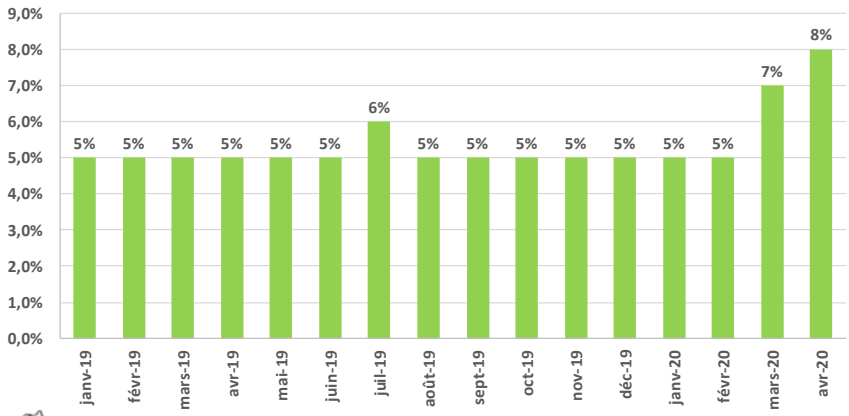
Source: Office of National Statistics

Fig. 27: Japan's Monthly % Share of Non-Store Sales to Total Retail Sales



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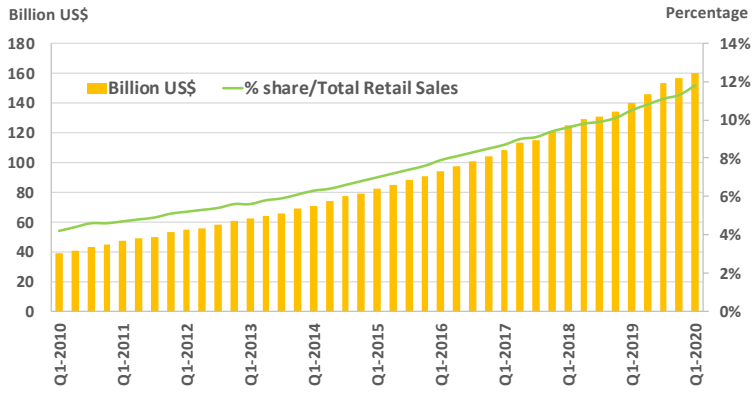
Source: Japan's Ministry of Economy, Trade and Industry

Fig. 28: U.S. Quarterly E-Commerce Sales



www.icac.org

Source: U.S. Census Bureau

or weeks in ambient, refrigerated or frozen temperatures.

The World Health Organization (WHO, 2020) had also noted that 'the likelihood of an infected person contaminating commercial goods is low and the risk of catching the virus that causes COVID-19 from a package that has been moved, travelled, and exposed to different conditions and temperature is also low'.

Considering these advisories, the immediate impact of COVID-19 on e-commerce can be seen from the sudden spike in online retail sales in various countries. While UK internet sales as a percentage of total retail sales have been increasing since 2007, it reached the level of 30% of total retail sales in April 2020 — the highest-ever reported online sales percentage. From Jan-April 2020, internet sales rose from 20.1% to 30% of total retail sales. Japan has also seen a positive trajectory in the share of non-store sales to total retail sales in the last year. A monthly analysis indicates a jump of 3% between Feb-April 2020, in which the non-store sales increased from 5% to 8% of total retail sales (Figure 26 and 27).

United States online sales figures (US Retail, 2020) for Q1-2020 indicated an increase of 15% from Q1-2019, growing from $139.7 to $160.3 billion. E-commerce sales in the first quarter of 2020 accounted for 11.8% of total sales. It is worth noting that the US has experienced an increase in e-commerce sales in the last few years, both in absolute values and share change. These figures were at their highest in the first quarter of 2020. With the outbreak of a global pandemic and implementation of country-wide lock down measures, it will be fair to expect that the Q2 of 2020 will represent higher figures (Figure 28).

Does this mean that the retail industry is witnessing a consumer shift from brick and mortar stores to online stores — or is this merely the impact of the current temporary

lockdown measures in place? In a Google consumer survey undertaken by Ripen ecommerce (2020) to analyse why consumers chose to shop offline rather than online, buyers indicated that the main reason was to see or feel the items in person and the instant gratification. However, with the closure of the retail stores and the omnipresent threat of infection due to human contact, it is unlikely that people will go back to retail stores to shop in the near future. In this scenario, it is expected that the people will turn to online purchases. The World Advertising Research Center (WARC) reported that according to a research from Ipsos, consumers in 11 of the 12 markets surveyed said they were more frequently purchasing products online than they would normally buy in-store. WARC notes that the largest increase in ecommerce spending has been seen in Vietnam (57%), India (55%), China (50%) and Italy (31%).

Figure 29. Ginning factories are working only partially

Figure 30. Cotton has been harvested in the southern hemisphere

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The ICAC Recorder

Can Cotton Survive the Great Lockdown? Initial Demand-Side Impacts of the Covid-19 Lockdown on the Global Cotton Market and Scenarios for Recovery

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Figure 1. Textile processing has resumed, but only partially in some countries.

Summary

The cotton sector plays a vital role in the global economy. Cotton as an agricultural commodity supports over 100 million families engaged in production and as an industrial commodity that is used to produce apparel and textiles. The global cotton market is affected by fundamental factors of supply and demand and thus has been impacted by the Great Lockdown resulting from the COVID-19 pandemic. The pre-COVID-19 trade environment had already been characterised by slowing global economic growth, slowing demand, geopolitical tensions, trade tariffs and a general move away from globalisation. The containment measures that have effectively halted an overwhelming portion of the global economy have and will continue to have deep impacts on the cotton sector.

As countries adopted severe containment measures to limit the spread of disease and protect human health, business activity and many other facets of life have come to a halt. The stringent containment measures to slow the spread of COVID-19 have, and will continue to have, important social and economic costs. As many businesses have been required to slowdown or close for the consideration of public health, in the cotton sector, clothing retailers have closed physical businesses, consumers have slowed clothing demand and manufacturing and supply chain activity in Asia and Southeast Asia have decelerated as orders have slowed or have been cancelled. Although the full impact of the Great Lockdown is not yet known, the potential for a further slowdown in global economic growth is expected and thus provide additional stress to the sector.

This brief provides an initial assessment of the demand side impacts of the Great Lockdown on cotton consumption from a reduction in global GDP growth, employment and consumer demand followed by recovery prospects. While uncertainty has not abated, responsive and transparent policies will help the sector recover in a new normal scenario until the public health crisis can be alleviated.

Additional analysis on support policies and pandemic response policies to small businesses is needed for greater understanding of the impacts on the cotton value chain. Even when the health impacts of COVID-19 have been controlled and uncertainty from the pandemic induced lockdown has abated, the cotton market will likely still be impacted by global trade tensions.

Current Supply and Demand Situation

Prices continue to fall under the pressure of the current environment. The ICAC's global production estimate for the 2019/20 season remains at 26.2 million tonnes as the consumption estimate has been revised downward to 22.9 million tonnes. Consumption estimates are near a 10-year low last seen in 2011 when cotton consumption slowed from a surge in cotton prices. With production outpacing consumption, ending stocks for the 2019/20 season are currently estimated to increase to 21.9 million tonnes, putting pressure on prices and forward season (Figure 2). With supply estimates increasing amidst decreasing demand, the stocks-to-use ratio is expected to rise to 0.96, a historical high, signalling a year's worth of manufacturing supply available in reserve without the

additional need of cotton production. Broadly speaking, when prices are low, farmers are less incentivised to plant cotton. While agricultural commodities are always subject to the uncertainty from weather, the current environment provides additional variability from the erosion of confidence and heightened uncertainty.

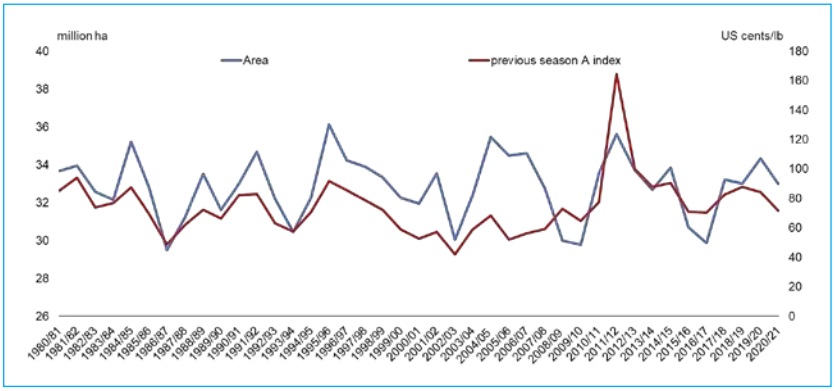

Figure 2. Prices Impact Planting Decisions

Consumption, or mill-use, is dominated by Asian and Southeast Asian countries where textile mills are primarily located. Consumption has been revised down for the current season and the forward season as demand has slowed dramatically from retailers in Europe, North America and China. Global consumption is expected to be 12% lower than the previous season with decreases across all major consuming countries. Consumption or mill-use of cotton lint in China had already been revised down for 2019/20 season considering the trade dispute with the United States and slowing economic growth. The additional slowdown in consumption in China from the COVID-19 lockdown has further reduced textile manufacturing. The consumption estimate for China is now 7.1 million tonnes, a 16% decrease from the previous season. The largest decrease expected in consumption may be in Bangladesh where mill-use is estimated at 1.2 million tonnes, a 25% decrease from the previous season as manufacturers have reported the cancellation and suspension of new orders as consumer demand drops off.

	2018/19	2019/20	change
World	26.0	22.9	-12%
China	8.3	7.0	-16%
India	5.4	4.8	-12%
Pakistan	2.4	2.2	-7%
Turkey	1.6	1.4	-8%
Vietnam	1.5	1.4	-8%
Bangladesh	1.6	1.2	-25%

Table 1. Mill-use Decreases Across All Major Apparel and Textile Manufacturing Countries

Likely Impacts from the COVID-19 Containment Measures and Potential for Recovery

The stringent containment measures needed to halt the spread of the disease have severely impacted economic activity. Restrictions on mobility have shut down business and schools. With non-essential activity limited, employment has increased further contributing to decreased consumer activity. As the pandemic situation continues to evolve, quantifying the impacts is difficult. Economic recovery will be able to begin only once the health impact of the pandemic has been brought under control. While a widely available and distributed vaccine would signal a return to normal, the current best-case scenario timelines for population wide vaccination are likely to be 12-18 months. A new normal, with protective measures in place that allow for the resumption of a greater level of business and economic activity could be envisioned as a mid-term scenario that would reduce unemployment and increase consumer confidence.

The IMF has currently projected that the global economy will contract sharply by 3% in 2020 and hedged the forecast as being made with extreme uncertainty[1]. Slowing economic growth leading to a recession would lower cotton mill-use. When GDP growth has slowed, consumption growth has followed (Figure 3) as demand for goods decrease with falling disposable income. Apparel and textile goods are income elastic with demand responsive to changes in consumer income. It should be noted that when economies expand and GDP growth is positive, consumption growth has recovered in the cotton sector. Although other sectors, particularly services such as tourism, may have longer recovery lags, manufacturing should be expected to respond when economic growth recovers. While the IMF's current projection for a 3% decline in GDP is more severe than the 2008 financial crisis, this crisis differs in that it was induced by a public health event rather than weak policies in the financial sector signaling the possibility of a smoother and swifter recovery under appropriate policy responses.

1) IMF, World Economic Outlook, April 2020.

Figure 3. Consumption and GDP growth

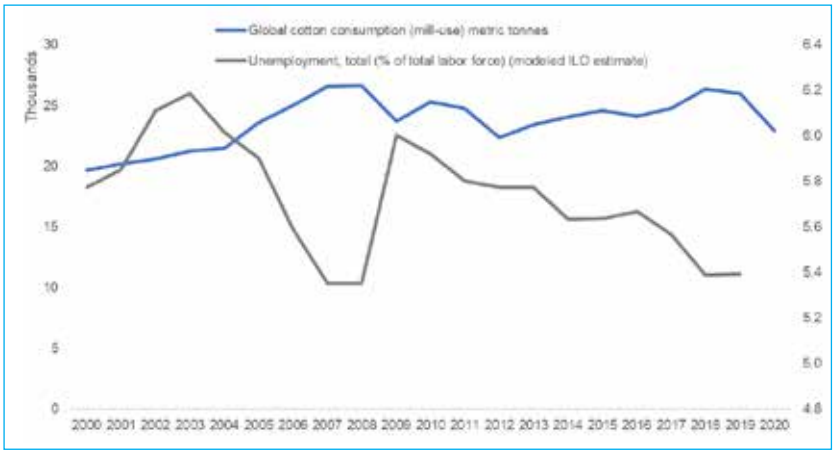

Figure 4. Cotton Mill-Use Increases with Falling Unemployment

to see income losses in the short term, expectations of increased spending should be anticipated as economies recover, thus indicating that with economic recovery, apparel and textile purchases should be expected to rebound (Figure 4) .

With higher incomes, consumers in Europe, the United States and Japan are responsible for importing 61.5% of the global apparel imports (Table 2). However, with increasing wealth, other consumers in Asia, particularly in China and Korea, are responsible for emerging growth with 13.7% and 15.9% growth in imports from 2017 to 2018. While GDP growth in advanced economies is expected to contract by 6.1%, growth in emerging economies, again particularly those in Asia and primarily China are expected to slow by a lesser margin. China remains the motor for growth in the global economy with a projected growth in 2020 of 1% (Table 3). While this would be the smallest growth in over 20 years, the resiliency of economic expansion is expected to enable a stronger rebound than other countries. Recovery from the pandemic lockdown has already begun in China and many other Asian countries as containment measures have been eased and businesses begin to reopen.

Changing consumer behavior from the containment measures have indicated an increase in online spending, but not enough to offset the losses. The widespread lockdown has resulted in record levels of unemployment. In the short term, these are expected to be temporary and social protection policies in many advanced economies provide income protection. Should unemployment become a longer-term impact, cotton consumption would be expected to decrease, however the speed at which workers return from temporary unemployment should mitigate the negative potential impact as income levels and consumer confidence return. According to a consumer confidence survey[2], sentiment varies across the set of major economies evaluated with greater confidence by consumers in China, India and North America and weaker confidence in Europe. While consumers may expect

Importer	Value (billion USD)	Global Share (%)	Growth rate (%)
Korea	11	2.0	**15.9**
China	8	1.6	**13.7**
Switzerland	8	1.4	12.6
Japan	30	5.7	**7.8**
Russia	8	1.5	7.3
Canada	11	2.0	4.9
EU28	204	38.4	2.8
USA	92	17.4	0.7
Australia	7	1.3	2.7

Source: WTO, World Trade Review, 2019

Table 2. Asian Imports of Clothing Grow Faster than Rest of World, 2018

2) McKinsey, A global view of how consumer behavior is changing amid Covid-19, 2020.

The COVID-19 pandemic will severely impact growth across all regions.

(real GDP, annual percent change)	2019	PROJECTIONS 2020	2021
World Output	2.9	-3.0	5.8
Advanced Economies	1.7	-6.1	4.5
United States	2.3	-5.9	4.7
Euro Area	1.2	-7.5	4.7
Germany	0.6	-7.0	5.2
France	1.3	-7.2	4.5
Italy	0.3	-9.1	4.8
Spain	2.0	-8.0	4.3
Japan	0.7	-5.2	3.0
United Kingdom	1.4	-6.5	4.0
Canada	1.6	-6.2	4.2
Other Advanced Economies	1.7	-4.6	4.5
Emerging Markets and Developing Economies	3.7	-1.0	6.6
Emerging and Developing Asia	5.5	1.0	8.5
China	6.1	1.2	9.2
India	4.2	1.9	7.4
ASEAN-5	4.8	-0.6	7.8
Emerging and Developing Europe	2.1	-5.2	4.2
Russia	1.3	-5.5	3.5
Latin America and the Caribbean	0.1	-5.2	3.4
Brazil	1.1	-5.3	2.9
Mexico	-0.1	-6.6	3.0
Middle East and Central Asia	1.2	-2.8	4.0
Saudi Arabia	0.3	-2.3	2.9
Sub-Saharan Africa	3.1	-1.6	4.1
Nigeria	2.2	-3.4	2.4
South Africa	0.2	-5.8	4.0
Low-Income Developing Countries	5.1	0.4	5.6

Source: IMF, World Economic Outlook, April 2020

Note: For India, data and forecasts are presented on a fiscal year basis, with FY2020/2021 starting in April 2020. India's growth is 0.5 percent in 2020 based on the calendar year.

Table 3. IMF Projections for Economic Growth

Recovery Scenarios for the Cotton Sector That Look Beyond the Immediate

Economic recovery and within this, recovery for the cotton sector, can occur once the public health crisis has been brought under control through eradication of disease threat, most likely through population wide vaccination. A timeline for vaccine development, testing and deployment to population level are likely to be lengthy with estimates from 12 to 18 months in a best-case scenario. Widespread vaccination and ongoing monitoring would need to be maintained successfully for the world to return to a pre-COVID-19 normal. Even in this scenario, the economic environment could likely be one in which trade tensions move toward to protectionism that dominated the pre-COVID-19 trade landscape in which cotton mill-use growth had already been muted due to slowing economic growth. However, even prior to disease eradication or population vaccination, government responses can help in the interim to enable a safe increase of business activity as countries emerge from lockdown. In this 'new normal' with safety ensured by proper local and national government responses and policies, businesses could safely reopen, and economic activity could begin to increase with appropriate precautions being taken to provide for health and wellbeing. As temporary unemployment levels begin to decrease and societies begin to find an equilibrium of operating in safe conditions, consumer confidence will increase and an uptake in apparel sales could be envisioned.

In a 'new normal', where the proper safeguards for human safety and well-being are ensured through appropriate government responses, a moderate recovery could be envisioned where consumer demand for apparel goods begins to pick up. The timeline for a moderate recovery would be dependent upon government responses that permit the reopening of business activity while ensuring that the pandemic does not spread without the need for the most stringent level of containment measures. This would provide for 1) a decrease in unemployment and 2) easing of uncertainty as more normal patterns of business and social activity are able to resume. With decreasing levels of uncertainty that have arisen from the pandemic, consumer confidence could return within a few months with a gradual increase of retail activity. With increases in demand, retailers would begin to increase the pace of orders from manufacturers. In this scenario, cotton mill-use could see little or no contraction in 2021. Business activity would be lower and GDP growth would be within the IMF's projections. However, as China has emerged from lockdown and is able to continue economic expansion, incomes in China would increase and could provide an uptake in consumer demand for apparel. A shorter or more moderate recovery could also allow an uptake in manufacturing activities in the developing countries of Southeast Asia where the small to medium sized enterprises that make up the spinning industry in this region to continue to operate.

A moderate recovery would impact

- **cotton mill-use** less severely as apparel demand could increase as business activity and employment increase even moderately as consumers, particularly those in Asia, resume clothing purchases. Little or no contraction in cotton-mill use could be expected for the 20/21 season if consumers in emerging economies are confident in their economic prospects.

- **prices** that are already under pressure are likely to remain low even at zero growth consumption as stock levels are at record level highs.
- **production** less severely as planting decisions for the forward season have been mostly made for the Northern hemisphere growers accounting for 80% of global production.
- **trade** less severely as supply chains that have shifted in the wake of the US-China trade dispute appear to be in place and able to supply cotton to needed markets.
- **manufacturing** less severely as the much of textile and apparel manufacturing in Southeast Asia has been undertaken by small and medium sized enterprises. While many brands have retained orders, others have been cancelled putting in jeopardy a spinning industry with little cash reserve to weather a long crisis. If orders even at slower pace can be resumed, these SME's may be able to survive.

A slower recovery could be envisioned where either stringent containment measures remain in place and government policies including those for public health systems, small business and unemployment remain weak or ineffective. Similarly, a prolonged recovery would be envisioned if containment measures are eased without appropriate provisions for human safety and well-being leading to a resurgence of disease spread. Either of these events would lead to a slower recovery, although a failure of government response and policy would likely also increase uncertainty, further prolonging economic recovery. A slow recovery extending beyond 12 to 18 months with little action to promote consumer demand would lead to a more severe contraction in cotton mill-use in 2021. With the 20/21 production estimated at 25.1 million tonnes, an additional slowdown would increase pressure on ending stocks which in turn increase downward pressure on prices. In a prolonged crisis, food security would become an important issue and smallholder farms in developing economies would likely switch to food crops.

A slow and prolonged recovery would impact

- **cotton mill-use** severely if businesses and stores remain closed, and temporary unemployment becomes more permanent, income levels will drop, and uncertainty of prospects will increase. Consumer demand for apparel and textiles being income elastic will decrease and mill-use which is currently near a 10-year low would decrease further.
- **prices** that are already low in real terms would have little upward movement without consumer demand for apparel. Prices which have had less volatility in recent years and have responded to market fundamentals would likely see greater price volatility a possible food security issues and economic uncertainty.
- **production** severely as planting decisions for the 21/22 season would be impacted by the prices already under pressure. Farmers would see little financial incentive and the likelihood of food crisis would put greater value on food crops particularly for smallholder farmers in West Africa and India.
- **trade** severely as trade follows both GDP and consumption growth.
- **manufacturing** severely as many small and medium sized enterprises in Southeast Asia would likely be unable to survive with reduced orders from brands and retailers.

The type of recovery in the cotton market will largely depend on the response of government in the form of transparent and effective policies to support agriculture, industry and consumers. While tremendous uncertainty remains, through appropriate policies, countries will recover at differing speeds. Countries need to provide transparent policies and data and work cooperatively within the international system. Cooperative international responses may also help to mitigate the trade and geopolitical tensions pre-COVID-19 that had provided and already uncertain environment of slowing growth, slowing demand and move away from globalisation. China's role in the global cotton market is pivotal and likely to remain so as the global leader for imports and mill-use as well as for the reserves quantities the country maintains.

Government interventions for recovery and reinvestment due to the pandemic are needed as well as eventual trade resolutions for a broader economic recovery, including the cotton market. During this unprecedented global pandemic which emerged as global economic growth had already begun to slow, the uncertainty in markets has increased as countries struggle to manage the spread of Covid-19. Containment measures, unprecedented shifts in the labour market and growing unemployment have led to sharp decreases in textiles and apparel sales as consumer demand has dropped. The current economic environment is an atypical slowdown from a typical recession as the containment measures for COVID-19 have closed business activity in a way not experienced in the modern era. A recession is defined as two consecutive quarters of negative economic growth and typically declared in retrospect. However, this recession is unlike others in some respects as it has been induced by a public health crisis rather than an event in the financial market. A depression is a long recession where unemployment reaches and remains at high level typically around 25-33%. The Great Depression was marked by a decade of high unemployment that had also been induced by ineffective economic policies. Additional analysis on the policy responses by countries will be key to understanding economic recovery and the speed of recovery for the sector.

Note: This report represents ICAC estimates as of June 1, 2020.

The ICAC Recorder

The Impact of COVID-19 on the Global Textile Industry

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and **Terry Townsend**, Cotton Analytics, 1013 Autrey St., #2 Houston, TX 77006

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Terry Townsend.: Worked as Executive Director of the international Cotton Advisory Committee (ICAC) from January 1999 to December 2013; Statistician (ICAC) from August 1987 to December 1998; Economics Research Service (ERS) at the United States Agricultural Department (USDA) as Economics Editor, Agricultural Outlook, January 1986 to July 1987 and Cotton & Wool Outlook and Situation Coordinator, March 1983 to December 1985.

COVID-19's impact on the world textile chain has been devastating. From retail to brands, textile mills, trade, producers and all associated industries, monetary and job losses are mounting. Estimates by the International Labour Organization (ILO) indicate that full or partial lockdown has affected 2.7 billion workers, or 81% of the world's workforce. The ILO estimates that the majority of the hardest-hit workers — about 1.25 billion, 38% of the global workforce — are in retail trade, accommodation, food services and manufacturing. Retail and manufacturing, including textiles, are facing the closure of retail stores, cancelled orders, job losses and reduced salaries, as well as suppressed demand for textiles, and clothing, especially fast fashion. There are several estimates of the number of workers employed in the global textile and cotton industry, ranging from 150 million to 200 million, and almost all of them are affected and face losses. The value of textiles produced in 2019 is estimated by the Grand View Research company at $962 billion. Production in 2020 could be reduced by approximately one-third, or around $300 billion in lost economic activity.

Order Cancellations Damage Demand for Textiles and Cotton

Textile demand contraction accelerated at the retail level in March and April and continued during May in every region of the world, as most of the stores and markets around the world have been closed for weeks, and retailers were faced with growing losses, large inventories and no in-store customers. At the same time, consumers are faced with sharply reduced income and substantially less ability to spend on non-essential items. Unemployment in the United States is estimated at one-third of the work force as of May 2020, a level not seen since the Great Depression.

Consumer spending priorities include food, sanitary items and utilities, rather than clothing and textiles. Major retailers have suffered significant losses and had to close stores. Macy's, Kohls, Gap, Bed Bath & Beyond, JC Penny, Levi Strauss and others have seen their sales decline by up to 90% during the shutdown. In Germany, the largest department store, Galeria Karstadt Kaufhof, filed for administrative insolvency, the equivalent of bankruptcy in the USA, as it was losing 80 million euros per week. The Galeria was a retailer for major brands such as Adidas, Calvin Klein, Ralph Lauren, Scotch & Soda and more. In the United States, J. Crew and Neiman Marcus filed for bankruptcy recently, and more retailers are likely to follow.

Major brands such Primark, C&A, Inditex, Matalan, JC Penny, Kiabi, Kohls, Marks & Spencer, H&M, Mothercase, Target, Tesco, Walmart and others have cancelled billions of dollars' worth of contracts with textile mills in major textile-dependent economies. Bangladesh has suffered the brunt of those cancellations. According to the Bangladesh Garment Manufacturers and Exporters Association (BGMEA), $3.11 billion worth of textile exports — 967 million pieces — were cancelled by the major brands, affecting 1,123 factories and 2.23 million workers. Some of the brands pledged to accept and pay for the orders already completed and even to create a wage fund for the workers who lost their jobs, but that represents only a small portion of the pre-COVID-19 business. In Pakistan, textile order cancelations are estimated at $1.3 billion, affecting hundreds of mills and millions of workers. The Indian Clothing Manufacturing Association estimates

that the Indian industry has suffered losses of $13 billion as a result of the shutdown and cancelled orders. Textile mills in China are returning to operations but indications are that they are only operating at about 30% of capacity. The Chinese textile industry is valued at $250 billion. Vietnam, Indonesia, Myanmar and other countries face similar cancellations. Spinners in all markets report a significant build-up in yarn stocks, order cancellations and contraction in operations.

Figure 1. Garments factory in China

The ITMF in March-April conducted a couple of surveys on the Covid-19 impact on the global textile industry. The survey reached 700 companies and indicates that in 2020, cancellations of orders could reach 31% and the employee turnover could reach 28%. That could mean total losses for the global textile industry of about $300 billion.

Figure 2. A warehouse under lockdown

World cotton mill use will decline during the last five months of the 2019/20 season because of the cancellations of orders in China and other major textile economies. It is estimated that if the loss in spinning capacity between February and July 2020 averages 30%, mill use of cotton could decline from 26 million tonnes in 2018/19 to about 23 million tonnes in 2019/20. Based on the loss of this volume in demand, losses for the global cotton industry are estimated at $5 billion.

Contract Defaults and Losses will Damage Cotton Merchandising

Plummeting demand from major cotton-consuming countries will mean a reduction of about 2 million tonnes in the world cotton trade, bringing the total closer to 7 million tonnes. The cancellation of orders from brands and retailers forced the closure of spinning mills and led to an explosion in contract defaults on a very large scale. This is a major crisis and many of the cotton merchants are suffering very large losses that can reach hundreds of millions of dollars. Many companies, especially smaller family-owned firms, will be forced out of business, similar to the crises in 2008 and 2011. Total losses suffered by the cotton merchants could range from $1 billion to $2 billion. It will mean further consolidation in the cotton merchandising industry, where multinational, multicommodity companies have a better chance of survival. The recovery will happen, but it will take several seasons before we return to pre-COVID-19 levels.

The decline in mill use is resulting in declines in exports and imports of cotton, and the ICAC estimate of global cotton trade in 2019/20 has been reduced by 10% to 8.3 million tons since the start of March, with further revisions in the estimate of trade possible. In addition to the decline in the volume of trade, prices have fallen. Cotton futures on the ICE contract fell from 70 cents in early January when reports of COVID-19 began surfacing in China to 56 cents as of mid-May. The changes in volume and price amount to a reduction in the value of cotton trade during 2019/20 of approximately $4 billion. There will be additional losses to the cotton industry representing the value of lost domestic sales.

The steepest declines in imports during 2019/20 as a result of the disruptions to trade caused by COVID-19 are in Bangladesh, down about 400,000 tons, China, down 300,000 tons, and Vietnam, Turkey and Indonesia, each down about 100,000 tons. Imports will be declining in almost every country during 2019/20.

Cotton merchants will bear much of the brunt of this decline in the value of trade because of contract cancellations and market losses. When merchants sell cotton to buyers, both domestic and international, they must procure the cotton and ensure it is in an accessible warehouse and ready to be shipped. For export contracts, merchants must arrange freight and insurance and ensure that phytosanitary certificates are issued. In normal times, documents are prepared, letters of credit are opened, and cotton moves from origin to destination according to schedule.

However, in the current situation, the movement of cotton has slowed dramatically, leaving merchants with stocks in

warehouses accumulating storage charges, which include insurance, warehouse charges and interest and average 0.8 cents per pound per month. These storage charges may seem small, but when added over 900,000 tons of reduced world trade, they represent costs of about $16 million per month.

The International Cotton Association (ICA), headquartered in Liverpool, is encouraging market participants to avoid contract cancellations and instead extend contracts for delivery later in 2020, without charge for carrying costs. Contract extensions, compared to contract cancellations, would enable merchants to salvage some of the losses they will otherwise experience.

Merchants are also facing losses on their hedges caused by contract cancellations. When merchants sell physical cotton to a buyer, they usually offset that risk by buying futures contracts. The decline in the value of futures from 70 cents in early January to 56 cents in mid-May represents additional losses to merchants.

In March 2008, ICE cotton futures changed from a century-old system of open outcry to fully electronic trading. Under open outcry, representatives of buyers and sellers stood in a circle on the trading floor in New York and screamed bids and offers at each other. The system was chaotic to observers but was understood by market participants. With fully electronic trading, all bids and offers were entered from computer terminals around the world, and while the system is efficient, participants were not used to it. During the first week of fully electronic trading in 2008, prices for cotton shot upward by about 40 cents a pound and then collapsed to their starting point. The gyration caught several major merchants without enough money in their trading accounts to meet margin calls, and several either went bankrupt or decided that the risk inherent in cotton trading was too great relative to the potential reward, and they chose to leave the industry.

As a result of the market gyrations in 2008, the merchant sector became more concentrated with fewer but larger firms. Decades ago, cotton was traded mostly by family-owned merchant firms that specialised in cotton and were named after the family patriarch. Today, most of the surviving firms are diversified with operations across many commodities, including grains, oilseeds and animal products, with cotton being just one component or division in a large corporation. The losses to the merchant sector caused by the contract cancellations linked to COVID-19 will likely cause more firms to exit the cotton trading industry.

Figure 3. A closed textile factory

Figure 4. Some garment factories have resumed activity

Lesser Effect on Production

At this time, cotton plantings for 2020/21 in the Northern Hemisphere, accounting for 90% of world production, are underway. Losses in cotton plantings and production are expected to be much smaller than in cotton demand despite a decline in cotton prices from 80 cents per pound in December 2019 to below 60 cents per pound today (per the Cotlook A Index). In some producing countries like Brazil, a switch from cotton to more attractively priced corn, soybeans and grain is expected. However, in other major producing countries, government programs guaranteeing target prices (like the USA), minimum support price (MSP) programs (like India and Pakistan) or direct subsidies (like China), will limit the extent of the decline in cotton plantings. Many producers have already made planting decisions but could change them at the last minute. For example, US prospective plantings for 2020/21 indicate only 1% decrease in planted area. However, many analysts expect a larger decline, as the surveys were taken before the major impacts of the COVID-19 became more obvious. Government economic relief/stimulus programs could also provide additional aid to cotton producers. However, in India and Pakistan, the lockdown has delayed seed processing, which could negatively affect plantings. In West Africa, the stronger US dollar benefits producers so cotton plantings might actually increase in 2020/21. Overall, global production could decline by 0.5-1 million tons, bringing the total closer to 25 million tons. That would mean an increase of about 2 million tonnes in world stocks, which will apply downward pressure on cotton prices.

The ICAC Recorder

COVID Shakes the Ties that Bind the Supply Chain

Companies must help each other survive the crisis or there won't be anyone left for a recovery

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The poorest have been the worst hit

As soon as the pandemic started, it was clear that there would be pain from one end of the cotton supply chain to the other, with no sector spared. The only real question was: *How bad will it be?*

That's not an easy question to answer at this point, other than the obvious 'very bad'. To understand the depth of the shock that the cotton industry has undergone, it's best to look at the situation from two perspectives: the short term, which consists of the present situation and initial recovery, and the long term, which takes a look at some of the potentially permanent changes the pandemic has brought about.

Because no matter how this ends, things will never be the same. As one graffiti artist observed in Hong Kong, there will be no 'return to normal' because normal is what got us into this mess in the first place.

And while there is no way to truly quantify the amount of economic devastation, infrastructure damage and sheer human suffering that COVID-19 has unleashed upon the world, we have little choice but to pick ourselves up, dust ourselves off, and figure out what we learned from this nightmare that can help us to recover and prevent it from happening again — or at least better position us to weather the storm if it does.

It Hurts All Over

During the early stages of the COVID-19 crisis, it quickly became clear that while some regions suffered more than others, no one was spared completely. When the global lockdown took hold, the supply chain shut down as though someone had flipped a switch. The last global pandemic was the Spanish Flu of 1918, and the modern world has changed so much in the last century that no practical insights can be drawn from that catastrophe to help us mitigate this one. No one alive has ever seen anything like this coronavirus, so there is no playbook for managing the crisis.

For this article, the primary information sources are a series of surveys that textile manufacturers have taken throughout the course of the pandemic. Three of the surveys were conducted by the International Textile Manufacturers Federation (ITMF), whose members were polled from 13-25 March, 28 March – 6 April, and 16-28 April. ITMF members and affiliated companies and associations were asked about COVID's impact on the global textile value chain, especially on current orders and expected turnover in 2020. In total, 600 companies from around the world participated.

The second source is a survey released on 17 April by the European Apparel and Textile Confederation (EURATEX) that received 815 responses from 13 European countries, primarily from small-to-medium sized businesses (82%) in the textile sector (71%).

Short-Term Outlook

Unsurprisingly, the initial numbers were grim — but they were only the tip of a devastating iceberg. In the first survey, ITMF members in almost every region reported only single-digit declines in orders (except Africa, which took a 13% hit). But things got much, much worse in the follow-up surveys, and the most recent poll shows that only the East Asian region has lost 43% of its orders. Across the three ITMF surveys, the global average was a decline of 42% but both North America and Africa lost about 40% of their orders (Figure 1) to regain lost share compared to the previous survey.

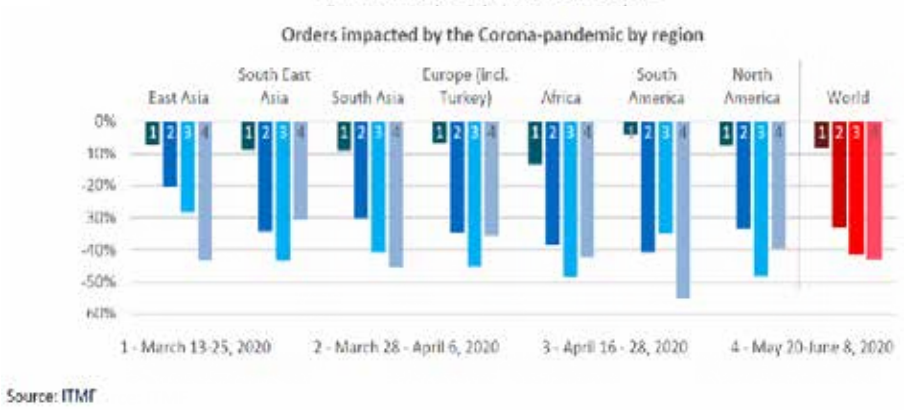


Figure 1. Worldwide, current orders are down by -42% on average

The numbers representing turnover are slightly less grim, but still heart-breaking. In the first survey, respondents said they reduced their workforces by 10% on average, but that number skyrocketed to 30% in the second survey and rose again, to 32%, in the most recent poll. South East Asian textile manufacturers seem to be expecting a decline in turnover of 22%, while South East Asian jobs are expected to drop by an astonishing 35% (Figure 2).

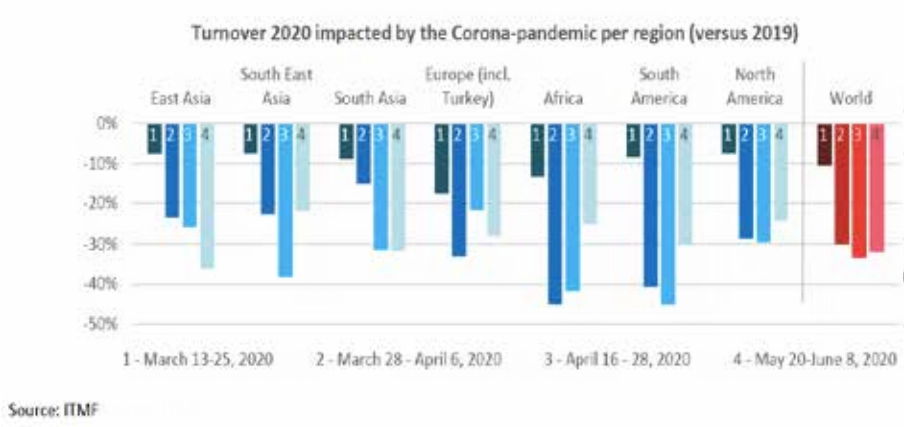


Figure2. Worldwide, expected turnover 2020 is down by -32% on average compared to 2019

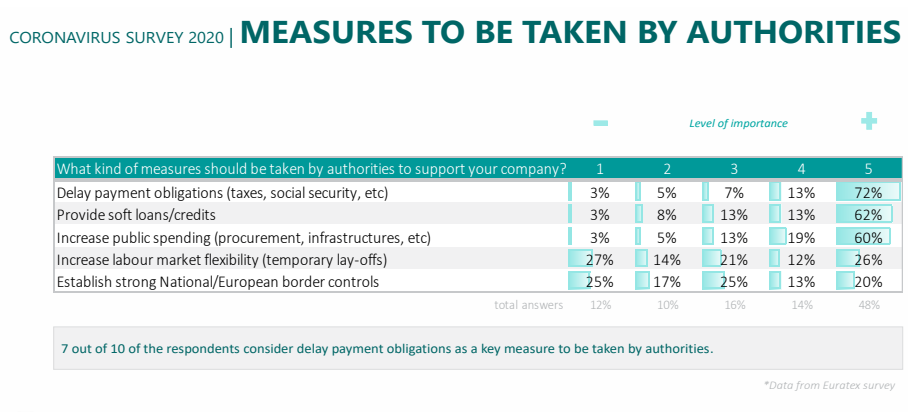
In the Euratex survey, 80% of respondents said they were cutting their workforces (at least temporarily) and 60% said they expected to lose 50% or more of their sales and production due to the coronavirus. Terrifyingly, nearly a third of respondents expect a sales reduction of up to 80%, while twice that many are putting off any near-term investments they had planned. And when 9 out of 10 respondents said they are concerned about the pandemic, the only surprise was that someone — anyone! — actually said they aren't.

The biggest concern, respondents said, is an expected decline in future sales (96%) — but second on the list was an expected increase in the cost of raw materials. Given their dire economic situation, it's clear that all businesses will increase prices as much as the market will bear to make up for their losses — but how much can the market bear? Spinners say that raw material purchases account for as much as 70% of their operating costs, so even a minor increase in the price of cotton fibre could be fatal to some businesses.

Generally speaking, there's not a lot that textile manufacturers can do to mitigate the damage in the short term. Consumers worldwide are not only staying at home rather than going to the shopping mall, they are also hoarding what cash they have during this climate of extreme uncertainty. Very few buyers are comfortable enough with their current financial situation these days to consider any of their income 'disposable'.

Cutting costs however possible, including temporary shutdowns, is one of the very few tools in the arsenal. This downtime would be an ideal time for businesses to invest but people are too concerned about how long the crisis might last, so those plans have been frozen as well.

More than anything else, businesses today need access to capital. They need to be able to pay their bills long enough to keep their businesses afloat until they can get back to



work. Governments should inject as much liquidity as they can into the marketplace now, because they will need tax revenue from those businesses in the future. And in places like Bangladesh, where garment workers earn a meagre living even during the best of times, providing even a little bit of economic assistance might literally be the difference between life and death for some people.

The Euratex survey made that need painfully clear. When asked what specific steps they want the authorities to take to mitigate the damage, nearly three out of four asked for governments to help their short-term cash flow by delaying major payment obligations for expenses like taxes and Social Security. The number two response was providing greater access to credit (Figure 3).

In the Longer Term

With no end in sight and a viable vaccine as much as 18 months away — assuming we can find a viable vaccine at all — it is virtually impossible to know what the 'new normal' will look like for the textile industry. There are a number of reasons for that as no one knows:

1. When the global shutdown will end.
2. What the supply chain will look like when it finally does end.
3. When consumers will feel comfortable enough to start spending once the immediate crisis is over.

The ultimate question, then, is: *How much has the consumer's psyche been affected by COVID-19 and how it might permanently affect their buying habits?* Several conversations with cotton and textile professionals revealed that there is both optimism and reason for concern.

The 'concern' part is obvious: Many businesses around the world have been shuttered permanently and an untold number of people lost some, if not all, of their life savings. The world has changed over these last few months and those changes surely will have long-lasting implications. Being forced to slow down gave people the opportunity to evaluate the world around them:

- With so few cars on the road, air pollution cleared up and people in India were able to see the peaks of the Himalayan mountains for the first time in decades.
- People spent more time with their families and put more effort into their relationships than they did on acquiring more possessions.
- Climate change became an even more important concern for people than it was before.

All of those things could cause people to rethink the way they look at clothes. Fast fashion has had devastating consequences for the environment … does that mean people will start to shy away from buying clothing that's virtually disposable and start choosing items that lasts longer, thus reducing their overall carbon footprint?

We likely won't have the answer to that question for many more months or even years, but it's indicative of the staggering amount of uncertainty regarding the future of textiles.

OK, It Happened. What Are We Going to Do About It?

Since they've been quarantined, consumers have more than tripled their online spending on casual apparel, which doesn't support the idea that people have become more socially and environmentally conscious. But the current situation is so far from normal that it's difficult to read much into consumer behaviour at this point.

After all, with people stuck in their homes and unable to go out in public, it's no surprise that casual apparel sales went up. Who's buying a suit or a dress when you're just lying around on the couch all day? Comfort is king right now — but that could change rapidly once we go back to work.

The biggest challenge the cotton and textile industry faces, in the eyes of the ICAC, is the current condition of the global supply chain. We know there has been damage to all sectors but we simply don't know how much yet — and we think it would be a grave mistake to assume things will simply go back to normal the moment consumers start buying again.

Many businesses have already closed their doors for good and, as painful as it is to consider, we know that some of the poorest and most vulnerable people in the supply chain won't survive the pandemic at all, let alone return to their former jobs.

It would be a grave mistake for those businesses that are able to weather the storm to assume that their supply chain partners will be ready and waiting to pick up where they left off. Furthermore, financial pressure has strained many relationships between buyers and sellers, so we know the supply chain won't look the way it did when this nightmare started.

To ensure that our industry is well-positioned for a recovery, the ICAC has developed a communications strategy designed to keep all stakeholders informed and connected throughout the crisis. It consists of special publications, such as this special COVID-focussed issue of the RECORDER, as well as the 'Cotton Connects' series of video interviews that provide updates and guidance from recognised cotton and textile leaders all over the world. Internally, we are working directly with our Member governments and the many businesses in our Private Sector Advisory Panel to collaborate on solutions to the massive problems we all face. And, as one of the founders of last year's inaugural World Cotton Day, the ICAC is implementing a comprehensive marketing plan that will ensure cotton and textile associations, businesses and individuals

Figure 3. Sowing operations have been affected due to labour shortages in developing countries

Figure 4. Textile factories have been affected due to restrictions on transport and labour movement.

Figure 5. Livelihood have been affected due to lockdowns, closed markets and curfews.

Figure 6. A few textile factories have started working, but to a limited capacity due to social distancing restrictions.

will be holding public events all over the world to celebrate all that cotton provides.

Everyone has been gravely hurt by COVID-19, but this is not a time for demands and accusations — it is a time to pull together and do everything in our power to help our partners, suppliers and customers survive. The ICAC publicly recognises brands and retailers, for example, when they announce that they will meet their financial obligations by paying for all work that has been done on their pre-COVID orders. To ensure we maintain an atmosphere of collaboration and good will, we do not shame the companies that have failed to meet their obligations. We prefer to put the spotlight on those who do the right thing.

So, if you can endure a more few months without payments from your customers, please give them that flexibility. If you've put in orders with your suppliers, pay them for the materials they've bought and work they've done.

If you don't have the financial resources to do that now, can you provide an official letter stating that you will make the purchases in the near future, so your suppliers can take that commitment to a bank to secure a line of credit? A simple letter like that takes only a few minutes to compose and it might be the difference between a business staying afloat and going under.

Remember that when this virus is under control, business will resume — but that will be incredibly difficult to do if we don't work together now to help each other survive and keep the supply chain intact. It's going to be tough to recover when companies try to return to their usual suppliers and find that many of them are gone forever.

If we are able to pull together as an industry and create an atmosphere of collaboration, innovation and mutual success, the cotton and textile industry will do much more than survive this pandemic — it will position the world's most important natural fibre to thrive long after it's over.

The ICAC Recorder

Potential Impact of COVID-19 on the Cotton Sector in Major Cotton Producing Countries

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Cotton at harvest stage

A severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) was first recognised in Wuhan in 2019 as a highly communicable virus whose origin is probably linked to the wet markets. SARS-CoV-2 causes Coronavirus disease of 2019 (COVID-19). The virus is related to the middle east respiratory syndrome (MERS) viruses, all of which belong to the family Coronoviridae. First limited to Wuhan, the disease spread across 188 countries across the globe affecting 7,690,708 people and causing 427,630 deaths as of 14 June 2020 (WHO, 2020); and the number is still growing. COVID-19 was declared a pandemic by the World Health Organisation on 11th March 2020.

Of the top 5 countries affected, USA was most severely affected with 2,032,524 confirmed cases followed by Brazil (828,810 confirmed cases), Russia (528,964), India (320,922) and UK (294,379 persons) as of 14 June 2020. Though Europe has been severely affected, the recent number of confirmed cases and deaths shows that the situation appears to have come under control, especially in Spain (243,605) Italy (236,651) where the number of new cases and deaths have reduced substantially. However, these numbers are directly impacted by the number of people being tested for the virus. It is also well known that asymptomatic persons also carry the virus.

Among the nine major countries that deal with 90% of global cotton (USA, Australia, Brazil, India, China, Pakistan, Burkina Faso, Uzbekistan, and Turkey), Brazil and Australia had to pick cotton during the pandemic peak, while other countries have completed sowing in April-May and are either planting now or preparing to sow cotton.

Death is one of the indicators of the severity of this pandemic. Amongst the major cotton growing countries, the following have been worst hit with the highest number of deaths as on 14 June 2020: USA (114,456 deaths), UK (41,662), Brazil (41,828), Spain (27,136), Mexico (16,448), India (9,195), Iran (8,730), Russia (6,948), Turkey (4,792), China (4,645), Pakistan (2,632) and Egypt (1,484). Disease progression and deaths have flattened in most other countries at the time of writing this report.

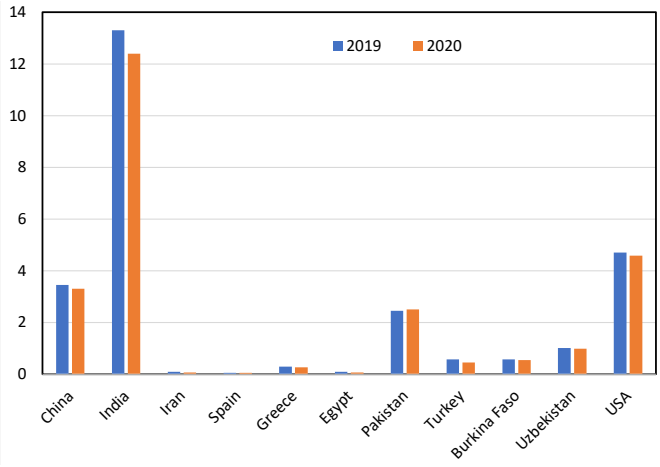
COVID-19 has affected the entire supply and value chains of cotton sales/procurement, trade, ginning, spinning, weaving, designing, apparel making, marketing and sowing for the next season. However, cotton production of the 2019-20 season has been least affected as more than 80.0% of cotton in India was harvested before the lockdown that was enforced on 24 May 2020. Countries in the southern hemisphere have just harvested cotton while countries in the northern hemisphere started sowing from April onwards. Inputs such as herbicides and fertilizers are crucial around sowing time. Many countries rely on import of inputs to meet their domestic needs in cotton farming. Imposition of lockdown and closure of airspace is expected to impact transportation of inputs. Cotton trade has been severely affected as brands are either cancelling or holding up orders. Cotton prices crashed to less than 55 cents a pound and this was associated with a crash in the prices of oil. On a positive note the demand for cotton masks increased and companies that manufacture personal protective equipment including face masks were able to continue their business operations during the pandemic.

It is important that governments devise policies and take responsible decisions for the welfare of the cotton producer and the textile sector, particularly in the poorer countries so that employment and livelihood are ensured.

Cotton sowing from April to July 2020

Cotton sowing is one of the most labour-intensive processes particularly in the developing countries, where farmers resort to mechanised land preparation and manual or semi mechanised sowing. A delay in sowing, impacts the quantity and quality of final yield and also renders the crop susceptible to pests and diseases thereby increasing the cost of production.

China, India, Iran, Spain, Greece, Egypt, Pakistan, Turkey, Burkina Faso, Uzbekistan and USA sow cotton between March and May. With the restrictions of lockdown and social distancing, agriculture though considered an essential service by most governments across the world, is being affected to varying extent. This is particularly true of India, Pakistan, and China where availability of manual labour, timely availability of good quality seeds and other inputs such as insecticides, herbicides and fertilizers are crucial for cotton sowing.



Graph. 1. Estimated cotton planting (million hectares) in March-July* 2020

China

Area, production, productivity and input use

Cotton in China is cultivated in the Yellow river valley and the Yangtze river regions covering Xinjiang, Hebei, Shandong, Hubei, Huwan and in a few other provinces in the eastern region. Of this, Xinjiang region cultivates nearly 85% (1,960,000 Ha with a production of 5.10 million tonnes) of cotton grown in China. The area under cotton in the year 2020/21 is expected to decrease by 0.6%. The decline in area particularly in the Xinjiang region was attributed to increasing land rents and decline in seed-cotton prices by 14.5%. Cotton cultivation in the other regions of China is not very remunerative as labour required for handpicking of seed cotton is expensive. With an area of 3,230,000 Ha, China demonstrated seed cotton productivity of 1,710 Kg/Ha of lint while the total production is 6,020,000 tonnes. China cultivates *Bt*-cotton and imports 12% of the cotton seeds that are sown. Planting is manual. China spends US$ 755/ha on fertilizers, US$ 250/ha on insecticides and US$ 40/ha on herbicides (ICAC Cotton Data Book, 2020). China plans to import one million tons of cotton apart from other agricultural commodities like corn and soybean beginning October 2020 from the US as part of the trade agreements (He *et. al*., 2020). Interestingly, US contributed 54.3% of the share of cotton imports into China in 2017 first quarter as compared to 20.3% in the first quarter of 2020 (USDA, Gain Report CH2020-0047, 6 April 2020).

COVID-19 pandemic and cotton production in China

The Xinjiang Production and Construction Corps, known as XPCC or Bingtuan specialising in mechanised cotton harvesting, supports cotton production in the Xinjiang region. 'Dwarf, dense, early' is the core technology supported by film mulching and drip irrigation.

China's responses to support cotton production in the backdrop of COVID-19, as of the 20th April 2020 are as follows: The Government and the Industry expedited supply of inputs to farmers particularly in the Xinjiang region. In Hubei, farmers were encouraged to raise nurseries for transplanting in late May and early June.

The China crop protection industry association reported that pesticide production is back to 70% of its normal production in 1400 enterprises and this was facilitated due to the lifting of lockdown. Almost all the key seed enterprises have returned to work with a production capacity reaching 62%. Enterprises producing urea, diammonium phosphorous, potassium and compound fertilizers have reached operation of up to 69, 61, 88 and 51%, of their full capacity, respectively. A recent report from the World Bank, seems to indicate otherwise; fertilizer prices dropped 5% in the first quarter of 2020. Hubei accounts for nearly one fourth of China's capacity to produce DAP, suffered severe

production constraints due to paucity of labour, a direct effect of the lockdown. Production rates of DAP fell by 20-30% which resulted in a price gain of 7.5% in the first quarter of 2020. Urea and potassium fertilizers suffered price drops of 2.7 and 8% in the same quarter (Baffes, 2020). The Chinese government offered a tax rebate on companies manufacturing more than 370 pesticide variants, as an incentive. A tax rebate of up to 13% was given to companies on manufacture of exported chemistries (David, 2020).

India

Cotton area, production, productivity and input use

Cotton is cultivated in 12 to 13 million Hectares with a production of about 6.5 million tonnes and a productivity of about 500 Kg lint/ha. Cotton is cultivated in 35% irrigated area and rest of the area under rainfed conditions. The crop is grown in 1.5 to 1.6 million hectares in north India under irrigated conditions. Cotton is planted in April-May in north, June-July in central region and July-September in southern India. Late sown cotton is often affected by the leaf curl virus disease in north India and sap-sucking pests and bollworms in other parts of the country that results in yield losses. Timely sowing of cotton in north India is facilitated by supply of irrigation water on time, availability of seeds and timely harvest of wheat. Timely sowing of cotton in rainfed regions depends on timely arrival of monsoon, availability of labour for land preparation and access to seeds and fertilizers.

Impact of COVID-19 on cotton production

Irrigation water for cotton sowing is supplied to farmers' fields through canals. These canals need to be de-silted on time, every year. Usually de-silting is carried out in February-March and was carried out before the lockdown. Rabi wheat needs to be harvested by mid-April as cotton sowing follows wheat harvest. With lockdown in place, wheat combine harvesters failed to move between states thereby causing a slight delay in wheat harvest, due to man and machine crunch. Also, the extended winter season and off-season rains delayed wheat harvest by at least 2 weeks.

Due to an extreme crunch in the availability of rural labour due to the lockdown (Bhagat et.al., 2020) and implementation of standard operating procedures as social distancing at market yards, both harvesting and marketing of wheat was impacted which in turn delayed cotton sowing in a few parts of north India. Cotton in north India is also partly sown by machines while in central India, sowing is done manually. Cotton is sown after wheat or mustard in North India, the former being the dominant sequence covering about 11% of the cultivated area in just Punjab (Singh *et al*, 2019). While cotton sowing has been completed in time in fields where mustard was harvested, cotton sowing after wheat harvest in May was delayed. Seed production of hybrid *Bt*-cotton is carried out mostly in South India and the seeds are processed, packed and transported to north India. Working under constraints of labour shortage, seed companies managed to transport seeds to main locations in north India using special train services. Of the 1.27 million packets of *Bt*-cotton hybrid seeds, 0.33 million packets reached farmers directly through home delivery services.

To minimise the impact of the lockdown on cotton sowing, the Ministry of Agriculture and farmers welfare ensured the availability of *Bt*-cotton hybrid seeds in north India well in time. It is worth mentioning here that the Indian railways played a remarkable role in facilitating timely transport of seeds and fertilizers during the lockdown (Kulkarni 2020). Indian Railways operated 67 routes for Special Goods Trains for perishable commodities including fruits, vegetables, milk and dairy products and seeds for agricultural purposes. About 1.0 million migrant labourers from the north Indian states of Uttar Pradesh, and Bihar form the backbone of paddy transplanting in Haryana and Punjab. In order to circumvent labour shortages, the government of Punjab suggested diversification of crops from skilled labour-oriented crops such as rice to the cultivation of maize and cotton which can be managed with local labourers. By the mid-June 2020, cotton sowing was completed in 1.68 million hectares in north India with 0.49 million hectares in Punjab 0.47 in Rajasthan and 0.72 million hectares in Haryana.

The cotton corporation of India (CCI) procures seed-cotton at the minimum support price (MSP) as stipulated by the government of India. Despite the constraints imposed by the lockdown, the CCI procured seed cotton equivalent to 1.7 million tonnes of cotton lint during the period October 2019 and May 2020. It is unlikely that procurement process of the remaining harvest would be completed before monsoon sets in given that 44,000 farmers are enlisted to sell their cotton in just one district of Vidarbha. As a result, farmers are resorting to distress sales at less than 50% of the prevailing MSP (Balwant Dhage, 18 May 2020, Times of India).

The Indian government launched a virtual marketing facility, e-NAM (National Agricultural Marketing) to enable farmers to sell their produce online, ensuring minimal human contact during the process of transportation and selling of the produce thereby circumventing the need of physical market yards and the Agriculture Produce Marketing Committee, (https://enam.gov.in/)

Farmers preparing for kharif sowing have been hoarding fertilizers as per the reports of the Fertilizer Association of India. Data from the department of fertilizers confirm that the all India nutrient sales were 2.06 million tonnes in April 2020 as compared to 1.5 million tonnes in April 2019 and 1.3 million tonnes in April 2018. Fertilizer hoarding may have been a consequence of speculations of impending shortages and a possible price escalation.

Pakistan

Cotton area, production, productivity and input use

Cotton cultivation is carried out over an area of 2.4 to 3.0 million hectares with a production of 1.4 to 2.4 million tonnes at a productivity of 600 to 800 Kg/ha. Sindh and Punjab together cultivate about 2,400,000 ha, with the latter accounting for 70% of Pakistan's cotton. The area under cotton in Pakistan was 2.45 million hectares in 2019-20. This year, the government encouraged cotton acreage and the area increased to 2.6 million hectares. Inputs such as seed, fertilizer, pesticide costs are 27, 104, 104 US$ per hectare, respectively. The cost of cultivation is US$ 855/ha and production cost is US$ 1.22/Kg of lint (seed value included) and US$ 0.32/Kg of seed-cotton. (ICAC Cotton Data Book 2020).

COVID pandemic and cotton production

The Government of Pakistan fixes the support price for cotton (Rana, et. al., 2020) which has been fixed recently at Rs. 4,224 per 40 Kg seed-cotton (US$ 64 per 100 Kg) for this season as a result of which cotton area increased slightly to reach 2.6 million hectares despite the lockdown which impacted the availability of *Bt* varieties in the form of acid de-linted-pesticide treated seeds. The government arranged for certified fuzzy seed bags of 20 Kg, at Rs.4300 (US$ 27) instead of Rs.6,500 (US$ 41.6). Similarly, certified acid de-linted 10 Kg seed bags were available at Rs.3,300 (US$ 20.6) instead of Rs. 5,250 (US$ 32.8). Good quality seeds were provided by the Punjab Seed Corporation and Central Cotton Research Institute, Multan.

Several committees with representatives from all stakeholders including farmers were set up to ensure quick approval of new varieties, bring about reforms in the seed sector, strengthen research in the cotton sector so as to revive the cotton economy in Pakistan. In addition, the government continues to provide subsidies on power, seeds, inputs and irrigation for cotton. Spinning mills have not been

operating to full capacity as a consequence of the lockdown; the cotton sector was affected due to cancellation of orders by leading apparel brands and ginning activity was low.

The government has also provided access to subsidised loans and liquidity through the banking sector at low interest rates. However, textile mills urge the deferring of electricity bills for 3 months and for providing tax holidays as short-term measures to tide over the pandemic. A recent book chapter (Rana et.al., 2020) suggested policies, which if implemented by the government, could have positive impacts on cotton cultivation and pricing in Pakistan. These include announcement of a minimum support price which could in turn motivate farmers to plant cotton on larger area and government subsidies toward targeted inputs thereby ensuring farmer's profits. Unrelated to this, farmers have been alerted about an impending attack of locusts (Chohan, 2019). Assistance for locust management has been sought from China in the form of pesticides and training for its management. A recent report suggests that germinated cotton seedlings in Multan and many other parts of Pakistan have been devastated by a locust swarm.

Turkey

Area, production, productivity and input use

Turkey is an important producer and consumer of cotton. The textile industry employs about 1.3 million persons including unregistered workers in manufacturing, distribution and marketing. It is a significant exporter of cotton to Europe and Bangladesh and cotton products to Europe. It also imports fine cotton from USA, Brazil and Greece. Cotton is exported at 1.1% of the total exports amounting to US$ 1.83 billion (2018) while it imports cotton up to US$ 2.51 billion. Turkey also exported 40,000 tonnes of hydrophilic cotton for medical purposes**.** Turkey produces 10,000 tonnes of organic cotton which was expected to increase to 15,000 tonnes in the current 2020-21 season. Turkey does not permit cultivation of *Bt*-cotton or permit aerial sprays of pesticides.

Cotton planting is carried out between mid- March and mid- May. The private sector today provides almost all the hybrid cotton seeds in Turkey. Cotton is cultivated in 3 regions (GAP region, Cukurova region and Aegean region) and the most dominant region is the GAP region that accounts for about 60.0% of the cotton acreage. For some time now, several steps were taken by the Government to benefit cotton production in Turkey. In the GAP region, dams and irrigation channels were constructed that were expected to facilitate an irrigated area of 650,000 hectares of land. Open canal system of irrigation was replaced with closed systems. Financial assistance and technical guidance for drip irrigation was provided by the government. Government incentivised cotton production by giving a bonus of 0.8 lira (US 12 cents) for every kilogram of cotton that was produced**.** In order to step up domestic consumption, licensed storage facilities were set up in GAP and Izmir for 15,000 tonnes and 10,000 tonnes respectively. Turkey has about 1,297 harvesters and cotton is machine picked. It also has about 550 roller gins that are privately owned. Better cotton initiative has facilitated 29% higher yields over the previous year through sustainable practises and has helped Turkey meet its domestic textile industry demands.

Turkey spends US$ 77, US$ 400, US$ 546 and US$ 26 per hectare on seeds, fertilizers, pesticides and manpower. The cost of cultivation is US$ 413 per hectare and the production cost is US$ 1.55 per kg of lint (including seed value) and US$ 0.59 per kg of seed-cotton (ICAC Cotton Data Book 2020). Turkey imports fertilizers from Iran.

COVID-19 pandemic and cotton production

COVID-19 remedial measures have recognised agriculture as an essential activity in Turkey. Despite supportive policies enacted by the government, the COVID-19 crisis led to a 21.0% decline in the sown acreage to reach about 0.44 million hectares compared to 0.57 million hectares in 2019. Aging farmers (65+) are restricted by law from doing farm work. In addition, farmers have requested for interest deferral on loan payments for 3 months and extra financial assistance to overcome inflation. Prices of agricultural inputs that are largely imported by Turkey have increased-seed prices increased by 19%, fertilizers by 18% and pesticide prices by 8%. On the other hand, price of cotton in Turkey has fallen 29.02% as compared to last year largely due to COVID-19. The Government promotes crop rotation every three years to protect soil quality and incentivises the practise through financial support. Incidentally 2020-21 is the year for a farmer to rotate crops in order to get government support. Turkey imports wheat, corn, barley, cotton,

lentils, paddy, chickpea, soybean and sunflower. With the pandemic, Turkey realised the need to become self-reliant (Mustafa, 24 April 2020, Al-Monitor). Low yields and low cotton prices, better returns from alternate crops and the rotation rule are the major reasons for the decrease in planting area in this year.

Uzbekistan

Cotton area, production, productivity and input use

Cotton and wheat continue to account for 70 percent of the total agricultural area, the same as ten years ago (Petrick and Djanibekov (2016). Uzbekistan cultivates cotton in 1.0 million hectares or more with a production of 0.7 to 0.8 million tonnes of lint. Cotton seeds are sourced locally and are manually planted. The country uses 351 Kg/Ha of nitrogen, 70.4 Kg/Ha of phosphorous and 20.2 Kg/ha of potash. Uzbekistan developed a new concept of cotton textile cluster, that are privately owned, where advanced technologies such as use of high-quality seeds, drip irrigation, installation of high-end gins were expected to increase yields. These clusters were meant to facilitate the integration of supply and value chain for attractive foreign investments and enable the utilisation of domestic good quality cotton to produce yarn and fabric. Fifty-eight clusters were set in 2019-20 to cover 30% of the cotton area in the country. It is now proposed to expand such facilities to 80 clusters with 43 new gins. Foreign investors in these clusters have been given a tax-rebate, customs benefits and land to cultivate and convert superior quality cotton into value-added products. According to a World Bank report, Uzbekistan proposed value addition to all of its domestically produced cotton by 2025.

The area under cotton in these clusters has been projected to reach 1.1million ha, an increase by 13.3% as compared to 2015. Land is being diverted to food, fodder and oilseeds. Any decrease in cotton area is expected to be compensated by an increase in yield through the adoption of high-end technologies.

COVID-19 pandemic and cotton production

Despite the strict restrictions imposed due to COVID-19, cotton planting was almost near normal with a slight decrease of 2-3% compared to 1.0 million hectares in 2019. The cotton pledge with 300 signatories from the industry had decided not to source cotton from Uzbek cotton fields until the govt ended the practise of forced labour in the cotton sector. Almost one third of adult population is involved in harvesting cotton manually in Uzbekistan (ILO 2017). The use of forced labour in cotton picking has declined by 40% in 2019 over the previous years (Shaku, 15 May 2020 Intellinews.com). COVID-19 has resulted in problems of unemployment and migration coupled with huge costs associated with health and economic losses. The lifting of the cotton pledge to support the economy was requested by the Government, as the pandemic swept through countries. This request was made in light of the roadmap to end forced labour in cotton fields. Cotton and wheat quotas were requested to be abolished, to permit the "freedom to farm" to raise the profitability of the sector (Petrick and Djanibekov,2019).

Brazil

Area, production, productivity and input use

The cotton area in Brazil expanded from 975,000 hectares in 2014-15 to 1.68 million ha in 2019-20 and was predicted to cross 1.7 million Ha in 2020-21. The increase in cotton area is attributed to an increase in agricultural land, investment in costly equipment with enhanced capacities which was associated with increased global consumption of cotton, despite high prices. Mato Grasso and Bahia cultivate about 90% of Brazil's cotton.

Studies carried out by the Institute of Agricultural economics revealed that production costs were expected to decrease in 2020-21. This decline was attributed to reduced use of pesticides including herbicides and fungicides associated with a decline in global prices. More than 95% of cotton sown in Brazil is genetically engineered with approval of 23 genetically modified (GM) events. Drought tolerance and insect pest tolerance traits in a few crops have demonstrated higher yields particularly under unfavourable conditions. A production of 2.88 million tonnes was possible due to various technological interventions such as the use of genetically engineered cotton and 7.0% increased use of fertilizers. Incidentally, 77% of fertilizers used domestically in Brazil are imported. Brazil is the largest importer of fertilizers, importing 4.65 million tonnes of N, 3.20 million tonnes of P and 6.03 million tonnes of K (FAOSTAT, 2020). In cotton fields, Brazil uses about 0.16 million tonnes of N, 0.17 million tonnes of P and 0.14 million tonnes of K (ICAC Cotton Data Book 2020).

COVID 19 pandemic and its impact on cotton production

Cotton production in Brazil was least affected directly by the COVID-19 pandemic because harvesting for the season was completed. By the time the pandemic hit Brazil, the cotton meant for export filled ports beyond capacity as strong demand and excessive rain were expected to impact harvest and transport of cotton. In fact, exports were less affected too with Brazil exporting the highest amount of cotton in its history in a single month just before the pandemic. By the end of May 2020, Brazil had already exported 1.6 million tonnes of cotton, about 60.0% more than the quantity exported in 2018-19 before the pandemic unfolded.

Despite turbulence in cotton prices to less than 50 cents a pound of cotton, Brazil was less affected because the value of its currency was less affected. China and US inked a Trade deal in mid-January that mandated China to procure cotton from US, thereby impacting Brazil adversely. Brazil was ahead in the use of drones and digital technologies in their production and agribusinesses. (Seleiman et.al., 2020).

Also, negotiations on cotton marketing are made by merchants with the producers even before the planting season, thus minimising losses to the producer at the end of the season in face of unexpected eventualities. Whether such negotiations are affected remains to be seen as Brazil becomes the 2nd worst hit country by the pandemic in terms of number of positive cases and mortality.

Egypt

Cotton area, production, productivity and input use

Cotton acreage in Egypt was expected to decrease by 35 % in the year 2020-21 from 100,000 ha to 65,000 ha. Egypt was expecting to harvest 337,000 tonnes in 2019-20 but reduced the estimate to 305,000 tonnes. The reduction was due to whitefly infestation on account of growing cotton and tomato together. Low quality seeds also impacted yields.

The seed, fertilizer and pesticide costs in Egypt are US$ 43, US$ 265 and US$ 434 per hectare respectively. The cost of cultivation is US$ 1,991 /ha while the cost of producing 1 Kg of lint is US$ 0.59 per Kg seed-cotton (ICAC Cotton Data Book, 2020). Egypt cultivates extra-long staple (ELS) and long staple cotton under irrigation where planting and harvesting is manual. To improve cotton quality, the government of Egypt took over the production and distribution of seed in 2017. The choice of the variety and where it is grown within the country is determined by the government to prevent admixtures of seed. Giza 96 is the best quality ELS variety while Giza 94 is the most popular long staple cotton that occupies about 60% of the area.

The Egyptian textile industry consumes 40,000 tonnes of domestic grown cotton in addition to importing of 23,000 tonnes of lint. In previous years the government of Egypt paid textile industries in advance so that they could buy cotton at a government announced price, from the growers. This practise was discontinued, and the government announced an indicative price expecting the textile industry to procure cotton from growers at the indicative price. Last year the Government did not announce an indicative price, and this is expected to have a negative impact on the 2020-21 season.

Egypt was expecting to install 3 ginning factories and had given guidelines to industries to continue with the work following all the precautions.

Greece

Cotton area, production, productivity and input use

Cotton is cultivated in 4 major locations- Thessaly, Makedonia, Thraki and Stereo Ellada that together cultivate cotton over an area of about 0.28 million hectares, with a production of 0.34 million tonnes. More than 90% of the cotton area in Greece is irrigated. Compared to 2018-19, cotton area increased by 16.3 % in the year 2019-20. The seed is locally sourced (95%) and seed cost incurred by the farmer is US$ 100 per hectare that is less than half of the global average US$ 200-344 per hectare. The cultivation cost is US$ 1,826 per hectare with fertilizer cost at US$ 222 per hectare and pesticide cost at US$ 441 per hectare. Incidentally, a few herbicides and acaricides were granted special exemption by the government for use in cotton recently. The production cost is US$ 0.56 per kilogram of seed-cotton. Greece consumes 16,000 tonnes and exports 303,000 tonnes of lint to Turkey, Egypt, China and Indonesia. Cotton sowing takes place during March and April, while it is harvested during October to November. Reports indicate that sowing operations were near normal and cotton was sown in about 0.28 million hectares as usual.

Iran

Cotton area, production, productivity and input use

Cotton is cultivated in about 90,000 hectares in Iran to produce about 80,000 tonnes of lint. The cost of cultivation is US$ 1,610 per hectare with US$ 75 per ha on seeds, US$ 36 per ha on fertilisers, US$ 279 per ha on pesticides and US$ 581 per ha on manpower (ICAC Cotton Data Book 2020). The costs incurred for producing one Kg of seed cotton is US$ 0.57 per kilogram of seed-cotton. Cotton is almost completely irrigated in Iran. The textile sector consumes 116,000 tonnes of cotton it produces domestically in addition to lint imports of 65,000 tonnes.

Iran was affected by 180,176 positive cases of COVID-19 with 8,584 deaths as on 12 June 2020. In addition, rising flood waters in northern Iran and locust invasions are impacting the agriculture sector, 90% of which is owned and run by the private sector. Import of ultralow volume pesticides for locust management has also become difficult owing to the lockdown. Agriculture in Iran accounts for 10% of the country's production and provides 18% of its employment. Iran also employs 300,000 persons in the textile and apparel industry with 9,800 apparel factories. Cotton sowing operations were affected due to the lockdown with a 15% decrease in the net sown area. (Dahan et al., 7 May 2020 reuters.com; Financial Tribune 24 April 2020; Glinski, 6 May 2020, Thenewhumanitarian.com)

Australia

Cotton area, production, productivity and input use

Australia cultivated cotton in 600,000 hectares in 2011, that got reduced to 82,000 hectares in 2019. According to the ICAC Databook 2020, The cost of cultivation in furrow-irrigated and overhead irrigated cotton ranges from US$ 2,594 to US$ 2,716 per hectare, whereas in semi-irrigated and skip-row dry regions cost of cultivation ranges from US$ 829 to US$ 1,489 per hectare. Because of the high input-use-efficiency, the production cost is low at US$ 0.29 to US$ 0.37 per Kg seed-cotton. Australia uses 421:108:54 Kg of N:P:K per hectare.

Australia is a major producer and exporter of cotton with 1,500 cotton farmers, (that varies depending on the area cultivated) producing 80 percent of the total crop. Cotton is a summer crop sown in the last quarter of the year and harvested in the first quarter of the next year. This period of the pandemic coincided with cotton picking in March-April. However, harvesting was least affected because it is machine driven. Advanced drought management techniques, soil moisture management, recycling of runoff water and introduction of varieties with drought tolerance have helped in improving cotton production despite prolonged repetitive droughts. In a typical season approximately 90 percent of cotton production is irrigated (where the irrigation water is sourced from irrigation schemes that have their own water storage dams) and 10 percent is dryland. Production in Australia is expected to increase from 0.14 million tonnes in 2019-20 season to 0.38 million tonnes in 2020-21 with a possible increase in area under cotton to cover 180,000 ha (Biki and Flake, USDA, 2020). With irrigation facilities that have been developed in the drought prone areas, even an above average rainfall could stimulate the increase in area from 82,000 ha in 2019/20 to 180,000 hectares in 2020-21.

COVID-19 pandemic and impact on cotton production

Of the 11 agricultural commodity groups analysed, seafood and meat exports are the only sectors that have been affected by COVID-19 in the early part of 2020 (Greenville et.al., 2020). The area and production in 2019-20 being small, cotton harvesting, was not affected by the COVID-19 pandemic in Australia. Coming to its impact on trade, COVID-19 did not affect the internal consumption of cotton as the domestic internal stocks were low. Cotton exports usually peak between April and August (as mapped over 10 years) and China is the dominant country importing cotton from Australia. Exports are expected to fall to 0.25 million tonnes as the domestic stocks were low. It is clear that the pandemic may not have impacted trade of cotton between April and June of 2020. Recent data indicates that import of important inputs into the Australian agriculture sector has been unaffected by COVID-19. Chemicals and fertilizers have lower input values in Jan-March 2020 as the demand was low as a consequence of drought. Reduction in costs, particularly of fertilizers has also impacted the import value (Greenville et.al., 2020). Australia has also been successful in managing the pandemic with reports of fewer positive cases and deaths as compared to the rest of the globe.

United States of America

Cotton area, production, productivity and input use

USA is one of the countries that cultivates both, *G. hirsutum* and *G. barbadense*. GM cotton is grown over 90% of the country's cotton growing area and the seeds are locally sourced. Fertiliser usage of N:P:K on cotton is 63:24:32 Kg/ha. Because planting is completely mechanised and does not require a large number of labourers as in developing countries, sowing has not been affected directly by COVID-19. However, trade implications do exist in the backdrop of Covid 19 and US-China agreements.

With an unsteady cotton price cotton, growers in the US are averse to taking risks and in Texas are likely to shift to corn to a small extent (Tasker and Clark, 2020). Cotton harvested area in 2020 is forecasted at 4.59 million hectares; and the figures are likely to be updated by 30th June 2020. The Southwest region (parts of Arizona, California and New Mexico) which is irrigated, is expected to cultivate upland cotton over 3.3 million hectares and is expected to contribute to 61% of the total yield. The South East and the delta region are expected to cultivate about 17% of the total upland area. Cotton area in the West is expected to be 97,166 hectares of which 92,308 hectares would be extra-long staple (ELS) cotton. Moisture conditions appear suitable for cotton sowing across the cotton belt except in South Texas.

Impact of COVID-19 pandemic on cotton production

In a podcast (Tasker and Clark, 2020) it was revealed that a strong purchase of cotton by China from the US was being made with the intent of building up reserves and the US-China trade agreement was expected to support the cotton supply chain despite the backdrop of COVID-19. Availability of inputs was not limiting for cotton production and social distancing was not an issue as most of the operations in cotton are mechanised.

Conclusion

The COVID-19 pandemic has been affecting agriculture in 2020. At the time of ending the article it was hoped that the infection curve was flattening out causing economies to

reopen, lockdowns to end, transport bans to lift, amongst others. Contrary to expectations, COVID-19 has continued its damage in regions despite lockdowns and also in countries that have exercised a limited unlock of their economies- where livelihood and employment mattered. Unfortunately, many of these countries grow cotton. Agricultural activities are timebound and any hindrance will cause shortages of food, feed and fibre; therefore agriculture cannot wait. This would be the first season where cotton is being produced in the backdrop of the pandemic, at a cost, that remains to be seen.

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Impact of COVID-19 on the Cotton Sector in Latin America and the Caribbean: Necessity to Rethink the Production and Marketing Model

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The spread of COVID-19 has deepened the vulnerability of millions of agricultural producers and workers in the agri-food industry and basic inputs and services; intensifying the feeling of uncertainty in the short and medium term for this section of the population. This new reality is even more intense in those countries with high levels of food and nutritional insecurity, where their installed capacities are limited to face additional risks such as those generated by the pandemic. In this context, there is a discussion on new ways and means of managing the diversity of agri-food systems and rethinking the established strategies, focusing on a new, inclusive, sustainable, and resilient model. The impacts of the pandemic cover a wide range of sectors and have forced decision-makers to change their original planning in the face of a situation that affects their countries and regions worldwide.

Since January this year, there has been a fall in energy product prices (oil, gas and coal, among others), aggravated in March due to the overall reduction in production and manufacturing activities in the world. In this sense, supply is also subject to external trade decisions, which, in turn, threaten the stability of domestic food prices. Thus far, eighty countries have enforced export restrictions as a result of COVID-19, and seventeen of these targeted exports of food and agricultural products (FAO and ECLAC, 2020). In the international market, these restrictions alter trade flows, causing a decrease in supply and a rise in prices, with a negative impact for importing countries, which depend on international prices and their equivalents in local currencies.

For the European Union and the United States, a decrease in exports of 16.1% and 11.6%, respectively, is projected; in the Latin American and Caribbean region, the Economic Commission for Latin America and the Caribbean (ECLAC) estimates a contraction in global demand in the short and medium-term for regional exports by 14.8% compared to 2019. This dynamic is part of the anticipated local unemployment figures, which could reach 11.5% in 2020, a 3.4% increase compared to 2019. Furthermore, in 2020, poverty is expected to increase by 4.4%, which means an increase of 28.7 million people in the poverty bracket. In addition to the negative economic growth, these projections directly impact household consumption and supply decisions (ECLAC, 2020).

The general global uncertainty at all levels makes projections difficult. However, it serves as a wake-up call to different stakeholders for the need to introspect on the production chains in order to serve the most vulnerable groups, guarantee food and nutritional security of the population, and expand the resilience of farming families, not only against the Covid-19 but also against the consequences of climate change.

COVID-19 and Cotton

The impacts of the COVID-19 pandemic on the global cotton industry are still unclear. The insecurity of the overall economy and projections of economic slowdown apply to all aspects through the cotton value chains, including products, co-products, textiles, clothing, etc. that have been disrupted and weakened.

Facing this uncertain scenario, the first estimates of the World Bank for 2020, foresee an average decrease of the Gross

Domestic Product (GDP) of -4.6%for the Latin American and Caribbean region, and even lower estimates of -5.2%, -5%, -6% for the main cotton producing countries in the region such as Argentina, Brazil and Mexico, respectively (Figure 1).

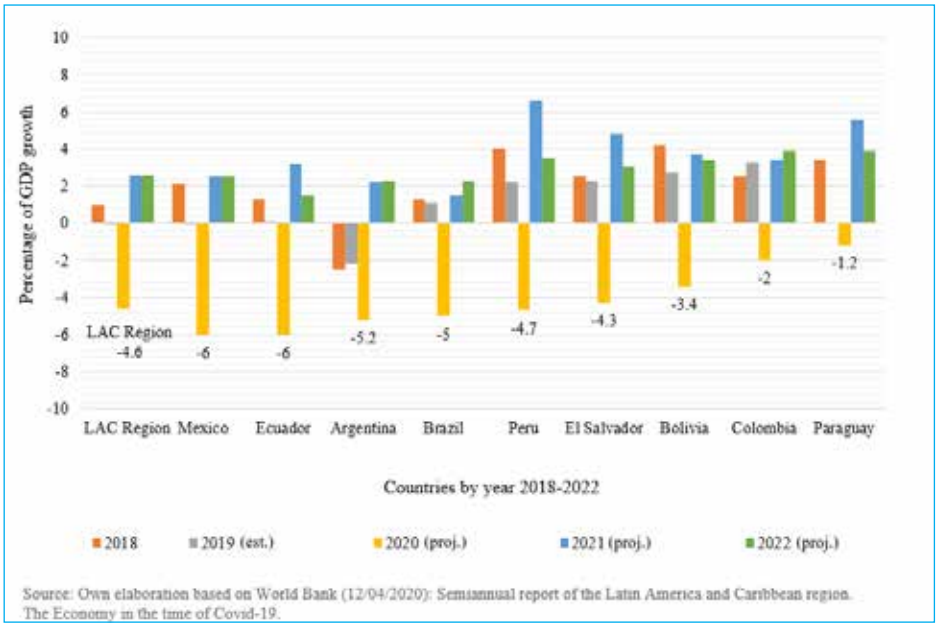

Figure 1.- Economic growth rate of Latin America and the Caribbean, by country, 2018-2022

In this context, it is observed that the demand for cotton has been strongly impacted. The United States Department of Agriculture (USDA) has predicted a 6.4% decrease in global cotton consumption. Additionally, due to outbreaks of COVID-19 in the USA and China, the main partners and export destinations of Latin America and the Caribbean (LAC), textile manufacturing activity decreased and, consequently, the demand fell globally. Manufacturing and supply chains in Asia have slowed their rate of production due to movement and work restrictions imposed on workers for public health reasons; and factories have suspended orders for clothing and commodities. A significant shock on the world market can be seen in leading stock exchanges where all marketable products except gold lost value.

Between 16 May 16 2018 and 15 May 2020, the volatility of cotton prices was significantly influenced mainly due to two factors: the trade dispute between USA vs. China and the COVID-19 pandemic (Figure 2). The impact of the trade dispute resulted in a 26% decrease in prices as on 11 June 2018 and 5 Sep 2019, thereby triggering subsidies to cotton growers in producing countries including the USA and some countries in the LAC region. As of 31 March 2020, the price was 48.22 cents per pound, representing a decrease between 38 and 41% over the prices before the trade dispute (prices on 9 April 2019 and 11 June 2018 respectively). This pricing dynamic threatens crop sustainability in the region and forces the cotton industry to reinvent itself in reactivation plans quickly.

The reduction in oil prices have direct implications on the decrease in the value of synthetic fibres that compete with fibres of natural origin, such as cotton, and is a factor of concern. Estimates of the International Cotton Advisory Committee (ICAC, 2020) foresee an increase of 19.1% in the world cotton inventories for the 2019/20 season, attributable to the increase in inventories of 3.9% in the collection centres of China, whose stored volume increased to 9.2 million tons. On the other hand, in the rest of the world an increase in volumes of 33% to 13.3 million tons is expected, given the production of this season's crops, which is expected to increase by 3%. According to the ICAC data, a 1.7% increase in global cotton production is estimated for the 2019/20 season worldwide, reaching a total of 26.1 million tonnes. This phenomenon may affect the income and access to essential services of more than 100 million

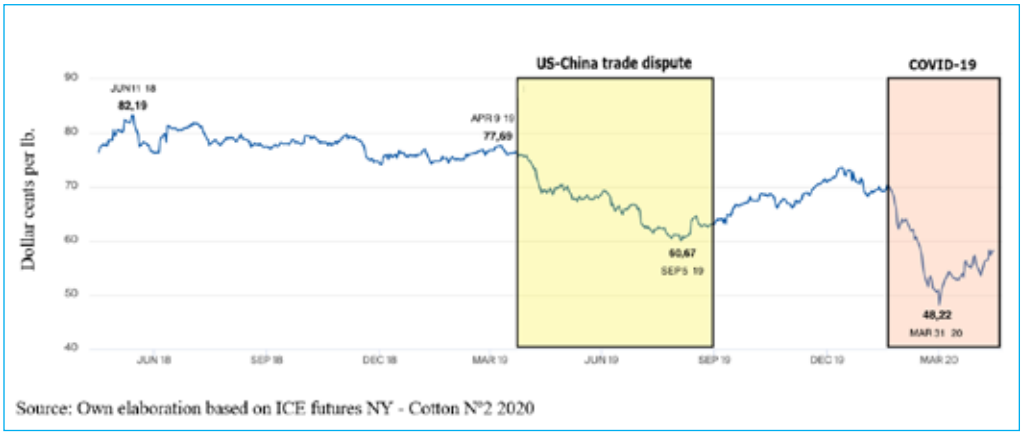

Figure 2.- "Cotton Nº2" futures in US cents per pound of lint.

families in the Latin American and Caribbean region, both farmers and workers in the processing industry (UNCTAD, 2019), putting their livelihoods and well-being at risk.

Asia stands out as the main importer of cotton for industrial purposes. Asian countries imported cotton worth 33.5 billion dollars in 2019, led by China, Bangladesh and Vietnam. Countries in the LAC region imported cotton worth US$ 3.9 billion, led by Mexico and Honduras as the main textile industries in the region. Comparing the regional export and import figures, the trade balance is slightly negative for the region, since LAC imported cotton worth US $ 220 million in excess than it exported. Figure 3 examines cotton trade flows within the LAC region and presents data on imports of the countries participating in the Project +Cotton. Amongst all countries in the region, Argentina stands out with the most pronounced decline in imports, not surprisingly because of the incentives for planting and domestic production, with an aim to activate its local cotton industry and encourage cotton textile exports after value addition. The sharp drop is noticeable in 2017, when 318,000 hectares were planted, and 580,000 tonnes of seed-cotton were harvested from the national average yield of 24.6 quintals per hectare (2,460 Kg/ha).

Examination of export figures from Latin American countries, showed that in 2019 the value of exports reached 3.7 billion dollars with Brazil, Mexico and Argentina as the main exporters to Asian markets. Export figures from Latin American countries reached $3.7 billion in 2019, with Brazil, Mexico, and Argentina as the main exporters to Asian markets. Asia is the main cotton exporting and importing region that has also been affected by the current crisis, impacting the ability of LAC countries to trade their cotton. Brazil's export growth has been the result of a 2019-2020 record crop, which will yield a production exceeding four times the national demand.

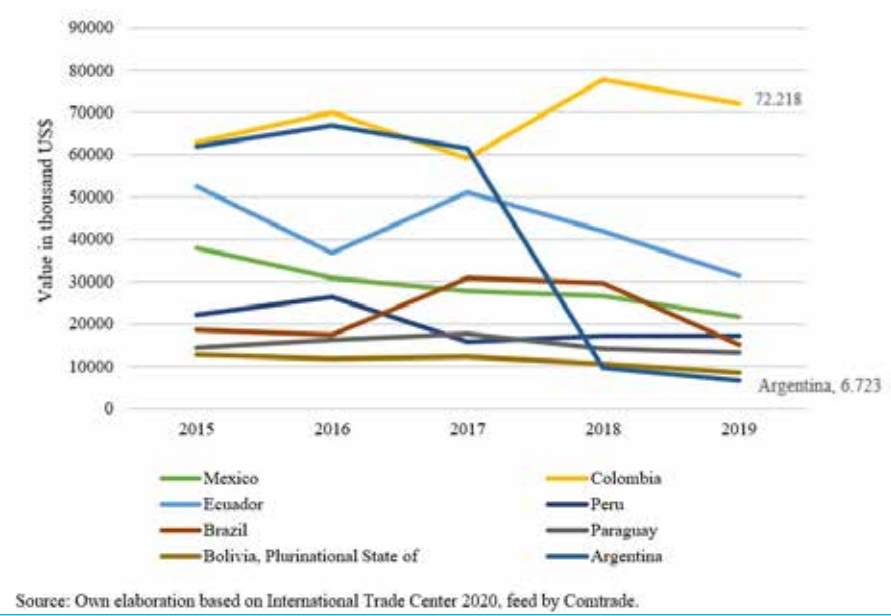

Figure 3.- Intraregional cotton imports, Latin America and the Caribbean and selected countries

On the other hand, exports of cotton and cotton products from Peru, Ecuador, Colombia, Paraguay and Bolivia have decreased since 2015. Peru experienced the sharpest decline, since cotton products accounted only for 1.9% of total exports in August 2019, 18.5% less than the previous year (MINCETUR 2020); however, Peru managed to strengthen cotton textile exports to the US domestic market. USA: dresses (+ 14.8%), sweaters (+ 13%), knit shirts (+ 9.9%) and T-shirts (+ 2.2%). USA was the leading destination for 51% of textiles exported by Peru in 2019.

During the period 2015 to 2019, the general trend of intraregional cotton imports in the LAC region was positive, rising slightly by 5% (UN-Comtrade, 2020). This indicates an opportunity for the industry in terms of regional trade itself, which would mean that maintaining this slight increase would contribute to the recovery of cotton markets at the regional level itself. In this context, promoting intraregional trade and catering to the local demand with local cottons is strategic to strengthen and give flow to the economies of the main cotton producing countries in the Latin American and Caribbean region.

Disruptions in the cotton industry

In general terms, COVID-19 appears to have caused the following four major disruptions in the cotton industry: (1) halt in commercial operations; (2) Stagnation of imports and exports; (3) drop in the price of cotton and oil and; finally, (4) devaluation of Latin American currencies against the US dollar due to expectations of an oil market saturation by viewing the dollar as a refuge and boosting its exchange rate. As the dollar becomes more expensive, it influences import costs, mainly from India and the United States, invoiced in dollars. While this rise may represent an opportunity for regional cotton exports, investment export estimates are higher in Latin American currencies (FAO and ECLAC, 2020a). On the other hand, the slowdown of the textile processing industry will have substantial implications in the regional and international trade; in Brazil, there is a paralysis of 91% of the industry; while in Asia there is a paralysis of up to 80%. Purchase and sale orders have stopped; shipments delayed up to 120 days. A period of at least 6 months is expected between the current status

and the resumption of the markets to the previous normal levels.

The global uncertainty has been perturbing the regional agricultural scenario; COVID-19 is impacting the availability of work due to the closure of companies in the face of the economic depression and has made the acquisition of goods such as machinery, tractors, and intermediate inputs such as fertilisers and seeds more expensive. Agriculture in the Latin American and Caribbean region is mainly family-based and represented by 20.5 million productive units (represents 81% of total agricultural units); -is aware of its greatly expanded challenges in the current situation. Agriculture sector has been experiencing challenges of information and training, credit, social organisation, information on markets, rural services, Technical Assistance and Rural Extension (ATER) and production systems. These challenges have greatly expanded due to the pandemic.

Cotton family farming

If, on the one hand, cotton family farming faces challenges, on the other, it is a sector recognised by its strong potential to contribute towards the sustainable production and development of rural economies, through the addition of value to its products through value addition to its products, guaranteeing generational replacement, and adopting innovations and technological tools to close the technical gaps faced in the field.

At this time, the Latin American cotton sector, like the global sector, is facing the economic and social crisis consequences generated by the pandemic. Its recovery will have to go through a systematic revival plans from production to trade, including producers, unions, industry, and government.

The social and economic heterogeneity of family cotton farming translates into differentiated typological profiles that, in turn, also generate differentiated production potentials that are strategic for to the revival of cotton-cropping systems, food security and livelihoods (Schneider, 2016). The families that adopt the diversified cotton-food production system consider food and nutrition security and income generation to be one of the drivers necessary for the economic reactivation of rural and urban areas, giving dynamism to an economy with an urgent need for innovation and reinvention.

This production and coordination system was promoted through the +Cotton Project, a Trilateral South-South Cooperation initiative, implemented between the Brazilian Cooperation Agency of the Brazilian Ministry of Foreign Affairs (ABC / MRE), the United Nations Organisation for Food and Agriculture (FAO) and partner countries Bolivia, Colombia, Ecuador, Paraguay and Peru. The vision of cooperation is to value cotton as a commodity crop that has a direct interface with food systems in general, both in production, through its diversified systems, and in processing, by its value-added products.

Measures against the crisis and the immediate context

FAO plans measures that can enable farmers to combat the crisis. The supportive measures include transfer of cash or reduction of individual debt of the most vulnerable families and groups, ensure that food banks and community food providers have means of delivery, establish rights to compensate for the loss of income, and maintain household food security (IPED FOOD, 2020). This is in addition to the urgent need to strengthen the resilience of agricultural communities against economic and climatic inclemency.

The current situation highlights the policies that have already been implemented in the region, focusing on sustainable production, distributing seedlings, seeds and other inputs to small farmers and vulnerable families for cultivating commodities; ongoing programs dedicated to the delivery of food in soup kitchens and schools; implementation of mechanisms for the direct sale of fresh family farming products at the domestic level, and policies aimed at increasing the liquidity of companies to subsidise costs for a few months, as well as economic incentives to protect the livelihoods of agricultural and livestock producers (FAO and ECLAC, 2020). The actions to be taken and the future initiatives must be compatible with the vast diversity of cultural, socioeconomic, or geographical contexts, and which can influence public health response.

These mechanisms would support the Latin American family cotton agriculture to transform challenges into opportunities, where the cotton-food system continues to play a strategic role in helping governments to guarantee food supply and income generation in the sector.

From a comprehensive perspective of the sector, it would be possible to promote the cotton agro-textile production system, through key initiatives as follows:

1. Agricultural digitisation with a focus on information and communication technology tools, digital agriculture, traceability and certification schemes for cotton and by-products, as well as remote Technical Assistance and Rural Extension (ATER) for socio-productive and marketing inclusion of family farming.
2. Financial support for initiatives and ventures that allow productive scaling, innovation and application of good agricultural practices.
3. Asset support for agricultural families that do not have access to land, water/irrigation, seeds, machinery, collective infrastructure, and construction capabilities.
4. Development of technical capacities in the territories

and establishment of public-private alliances, with a focus on inclusive and participatory community management (women, youth, and indigenous populations).

5. Expansion of associations and cooperatives to rejuvenate the contribution of the regional communities so as to strengthen social and economic solidarity that supports supply and access to food.
6. Regional strategies that integrate and expand cooperation between the countries of the LAC region and public and private organisations with a focus on developing the supply and consumption of products from the cotton agro-textile system.

These strategies, if implemented effectively, have the potential to catalyse the economic recovery of countries, especially where cotton farming families are also producers of food and value-added products. Strengthening of the national production systems, processing and manufacturing industries and promotion of trade can help the process of recovery in a new global revival scenario.

Figure 4. Most spinning mills are closed

Figure 5. A few factories have opened to partial capacity

Figure 6. Factories in Asia have started to open.

Conclusions

The Latin American cotton-producing countries may launch two strategies: to strengthen domestic cotton and by-product consumption; and to strengthen integration processes into intra-regional trade by taking advantage of LAC trade agreements, tariff preferences, and eligibility conditions, which are built and have been proposed as routes to develop sustainable markets.

Sectoral planning at the regional level will be an anchor to combat the post-COVID-19 challenges. The support of public, private, civil society, and regional and international organisations are central to advancing the resumption of economic development, taking into account social and environmental challenges.

The post-COVID world provides an opportunity to revamp different agricultural and value chains. The ultimate objective is to plan and implement economic reactivation processes in a more comprehensive format, building regional capabilities to withstand global crises, transforming the vision of net producers of raw materials destined for other continents, for a vision of strengthening national and regional economies, with inclusive, resilient and sustainable guidelines for a growing and demanding world population of food and diverse products.

Latin American cotton family farming becomes a strongly allied sector for implementing an intraregional market strategy, where sustainability of the production system is the basis for commercial innovation, projecting new social, economic and environmental scenarios for countries to contribute to the Sustainable Development Goals (SDGs) 2030 Agenda in Latin America and the Caribbean.

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The ICAC Recorder

Potential Impacts of COVID-19 on African Cotton Sectors

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Jacques Lançon: Cotton Breeder, Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), France. Specialized in agronomy and plant breeding, Jacques has been working since 1981 at CIRAD. During 20 years, he developed several varieties with African partners, in Zambia, Cameroon, Ivory Coast, and Benin. He worked on methodological aspects of plant breeding, crop management, and participatory research. He was, until 2016, the regional director of CIRAD in Eastern and Southern Africa. Jacques is in charge of the Science-Society issues at CIRAD, in Montpellier. He is involved in a project on the production of quality cotton seed for Africa.

The current situation of COVID-19 in Africa

The African Centre for Disease Control and Prevention statistics and data provide clear evidence indicating an expanding trend in the number of COVID-19 cases across the continent. The first case was reported in Egypt on 14th February 2020. Two months later, by 14th April, the number of cases increased beyond 15,000 across 52 countries. The number of reported cases has now increased almost 8-fold, surpassing 121,000 on 5th June 2020. African COVID-19 cases represent less than 1.8% of the global infection and less than 0.7% deaths, while Africa has 17% of the global population. Some believe that high temperatures, a preponderance of youth, limited population movement between countries may explain the relatively low infection rate. However, in comparison to the global situation, the African data has the potential to create a dangerous false sense of "safety" and a number of factors must be taken into account:

- Capacities to test and report are limited by both resources and access to significant portions of the populations;
- Internationally recognised measures to reduce/slow the spread such as increased personal hygiene and "social distancing" measures are frequently not practically possible; and
- Significant numbers of the population are at even greater COVID-19 risk due to existing health challenges including HIV Aids, Tuberculosis and Malaria, while these also have potential to distort or "mask" identification and reporting of COVID-19.

Most countries have implemented restrictions on movement and gatherings, particularly those limiting the potential introduction of additional new cases through regional or international travel. Borders across the continent to a large extent remain closed, passenger flights have been prohibited and many countries have banned the movement of people between urban and rural areas. Other restrictions and guidance such as night curfews, closure of public places such as schools and places of worship, and limited operation of public transport are also in effect.

Impacts on African economies

According to the United Nations Conference on Trade and Development (UNCTAD), the global recession due to the COVID-19 pandemic threatens African economies through falling commodity prices and reduced international demand. This situation is worsened by the sharp decline in processing capacity in highly industrialised countries (United States, China, Europe, etc.). This threat is all the more important as African economies suffer from a lack of diversification. For example, in West Africa, countries such as Mali and Burkina Faso are heavily dependent on agricultural exports such as cotton. Cotton is an important source of foreign currency for several African countries and therefore the reduced prices and low demand may continue to impact national reserves for several years.

Understandably the immediate focus of continental, regional and national governments has been on the potential health implications of COVID-19 and the possible mitigating measures that can be applied. Gradually the economic impacts, including those on individuals and businesses have started to be addressed. Several nations have promulgated exemption and/or deferral on a variety of taxes including import duties, whilst central banks have reduced interest rates and provided liquidity to allow commercial banks to defer payment of loans. In some countries, Governments are providing partial or full relief on the costs of water and/or electricity. Increasingly, tools for economic stimulus including support for key sectors, private businesses and the self-employed are under consideration. At the end of March the Prime Minister of Côte d'Ivoire announced a plan to support the national economy against the spread of the coronavirus. This plan aims to preserve the production tool and employment and prepare for a rapid resumption of activities at the end of the pandemic. It includes an allocation of 300 billion CFA francs (USD 495 million) for the agricultural sector, including 250 billion CFA francs (USD 412 million) for the main agricultural sectors, notably cashew, cotton, rubber, palm oil, cocoa and coffee. In Mali, according to the Financial Afrik website, the government says it is going to maintain a subsidy of 10 billion FCFA (USD 16 million) for cotton farming. The Commodafrica site reports that agricultural measures are also planned in Togo and Burkina Faso with a potential FCFA 100 billion (USD 160 million) stimulus package.

Impacts on African cotton producers

In Africa, cotton is mainly produced by smallholder farmers, who also produce food and other crops. Disruption of smallholder agricultural production and/or market access by the pandemic will not only affect farmer incomes but will also have a significant impact on food security both within communities and on a national scale. Cotton is usually sold by producers to cotton companies, who also supply inputs and provide extension services during the sowing and growing season. In most countries, an indicative price payable to producers for seed cotton is negotiated between stakeholders before the start of the crop season but it is also frequently linked to international price indicators.

Figure 1. A cotton field in Africa at harvesting stage

In countries of the southern hemisphere, including Zambia, Tanzania, Mozambique and Malawi harvesting has commenced or is about to commence. Current national restrictions in these countries have not been affecting access between cotton companies and farmers significantly, but this may not hold true for processes that operate through the full harvest and delivery to ginning factories. In these countries, the impact of record low international cotton prices will have negative consequences on the incomes of both farmers and cotton companies.

In countries of the northern hemisphere including Benin, Mali, Burkina Faso, Côte d'Ivoire, Cameroon, Nigeria and Chad, field preparation and sowings began in mid-May. Although seeds are generally available, the availability of, particularly, imported inputs such as fertilisers and chemicals is a major concern in many countries. In these countries, the seed cotton purchase price negotiated for the 2020-2021 crop season will be revised downwards. Thus, in Mali, it will fall by almost 30%, to 200 CFA Francs (USD 0.33) per kilogram of seed cotton against 275 CFA Francs (USD 0.45) in 2019-2020. In Cameroon, where the purchase price was 255 CFA francs (USD 0.42) in 2019-2020, this drop could reach about 12%. A decline is also expected in Benin, and many other West and Central African countries.

Impacts on African cotton companies and traders

The cotton trade is currently in stand-by mode, with shipments of pre-sold lint on hold. The COVID crisis, which has brought the international textile and value chain to

a virtual standstill, has led to a drastic drop in fibre consumption due the cancellation of orders. This has resulted in accumulation of large stocks in most cotton producing countries. It is not as yet clear as to when the releases from containment will allow stocks to be absorbed. Trading is therefore caught in a pincer movement between producing countries that have to liquidate their bales and the consuming customer countries who do not want to take delivery.

Figure 2. Cotton seed-oil processing in Africa

The Commodafrica website reported on 28th May that in Côte d'Ivoire, cotton fibre exports had fallen by 25.1% in the first quarter of 2020, compared to the same period in 2019. The cumulative volumes shipped were 99,068 t against 132,350 t in the previous year. In its 1st April raw materials column, Radio France Internationale (RFI) quotes a trader: "*There is cotton that should already have been on the water and is still in Africa* [...]". This cotton will therefore have to be stored "*as the rainy season approaches*" in West and Central Africa. This storage at the origin will incur additional costs. RFI points out: "*Some trading players could be forced out of business as the shock is so strong on the futures market in African countries that have not sold all their crops. Cotton companies should be forced to lower prices to producers for the next season. The world price of the fibre is no longer sufficient to cover its cost price*". (Figure 3)

In the meantime, cotton-producing countries in the northern hemisphere, which are completing the ginning of the 2019-2020 cropping season, are directly confronted with the drop in international demand. The consequences have presented significant cash flow difficulties for the sectors, even if part of the sale was concluded at term, before the COVID crisis. Cotton-producing countries in the southern hemisphere have barely begun ginning, and, with no clear view of the medium term economic impacts of the pandemic, face significant uncertainty and challenges regarding both demand and price going forward.

Figure 3. A ginning and pressing factory in Africa

Impacts on African cotton production

Cotton producers generally choose to grow crops based on market prices of the preceding season. A drop in the market price of seed-cotton is generally followed by a concomitant drop of interest of producers towards cotton growing. Farmers may then direct all or part of their fields towards other crops, considered less labour intensive, and/or more profitable under the prevalent conditions. In addition, the availability of inputs (fertilisers, pesticides, seeds) that are critical for cotton production could be reduced in some countries, which could influence their crop-preference decisions. Finally, if the pandemic continues its spread in Africa, it could affect the availability of labour to carry out fieldwork from sowing to harvesting.

A reduction in African cotton production can therefore be expected during the 2020-2021 cropping season. In Benin, the production target of one million tonnes of seedcotton will be difficult to achieve. The other main African cotton-producing countries (Mali, Burkina Faso, Côte d'Ivoire, Cameroon, Tanzania, Zimbabwe, *etc*.) are also likely to experience a decline.

As alternative cash crops to cotton are not very numerous in most cotton regions, there is a concern that the decline in the procurement price of seed-cotton will have a direct impact on household incomes and food security. Moreover, closed borders and limited market access could lead to a disruption of trade:

- Increase the cost of staple foodstuffs and possibly lead to shortages;
- Limit access to essential seasonal inputs such as seeds, fertilisers and pesticides; and
- Delaying or preventing the harvest and/or sale of crops, especially cotton.

Figure 4. Small-scale handloom garments -Made in Africa

Figure 5. Handloom weaver in Africa

Thus, the impact of the pandemic on world markets could have serious consequences for farmers and agribusinesses in Africa. Even if, compared to other perishable commodity chains, cotton is a storable product, which, as Max Havelaar France reminds us, constitutes a safety net.

The future

The pandemic has focused attention. However, it will soon be necessary to return to other important issues such as locust infestation, climate change, social inequalities or insecurity linked to the opportunistic expansion of fundamentalist groups.

Beyond the sadness of the situation for numerous small and a few bigger cotton actors, the African cotton countries will have to draw lessons from this crisis. Because they cannot commit as many resources to support their population and preserve their economy, they are more susceptible to the effects of international crises. Diversity, solidarity and local development are among the key factors to make these countries more resilient - diversity in products and markets, solidarity among all the actors of the commodity chain, and increased shares of the global value at each stage of cotton chain, at the local and national levels.

Based on these principles, CIRAD and ACF are engaged in a number of activities, and, with the support of the German Development and GIZ, are putting in place a project called Cotton Seed Improvement for Africa (CSI4A). It aims to contribute to securing the production of good quality cottonseed for the continent.

Figure 5a. Handloom weaver in Africa

The ICAC Recorder

Possible Impact of COVID-19 on the Global Cotton Sector

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Karsten Froese: Director for Quality and Trade Department, Karsten has been working for the Bremen Cotton Exchange since 2010 after various professional positions in the areas of logistics, control and cotton trading. Besides his work for ICA Bremen, he is also involved in various committees of ICA, ITMF and FIBRE.

Looking at the impact of COVID-19 on cotton production, it would be useful to distinguish between the Northern and the Southern Hemispheres, and between the ongoing and the next season. In the Southern Hemisphere and for this season, planting was done prior to any major impact of COVID-19 so growth should be nearly finished and harvesting ongoing. Therefore, there will be no impact on the planted acreage, on the production amount, quality or costs. ONLY for harvesting, ginning and finally shipment might there be an impact on the availability of workers and logistic capacities.

Even in the Northern Hemisphere planting has already been finished in some regions for the season 2020-21. In those cases, where planting started after March, an impact on the planted acreage may happen, reducing the area where cotton is planted. With the given planted area and expecting lower cotton prices, farmers will look to reduce the input costs and try to balance costs and yield.

Figure 1. A cotton field in Xinjiang, China. Cotton planting has been almost completed in the northern hemisphere.

Just as in the south, there could be an impact of available manpower for harvesting and ginning in the north too, depending for example on hand or machine picking. Depending on the further development of the crisis and the political actions which need to be taken during harvesting time in season 2020-21, the Northern Hemisphere will face similar problems like the crops of the Southern Hemisphere. The impact on countries like in West Africa, which needs to export cotton, will be severe.

Figure 2. Cotton ready for harvest in the southern hemisphere

ICAC expects a reduction of the area under cotton for the season 2020/21 by 4.0%. In view of falling cotton prices (see below), the next season will show a much more reduced cotton planting acreage, probably levelling out with the reduction in textile production.

In comparison to competing crops — usually food crops, cotton will be more affected than other crops, as the consumers can reduce textile consumption easier than food consumption – cotton and textiles are very sensitive to economic fluctuations.

On the other side, there is the textile demand. Textile demand is currently strongly affected, cutting down mill orders by more than 40% in April, and mills expecting an annual decrease of the turnover by more than 30.0% for 2020 [ITMF survey, 28 April 2020]. Many people cannot buy textiles due to the curfews, their available budget is drastically lowered for many people due to unemployment, and people will become cautious about any subsequent Corona waives or other crises. Textile companies are getting fewer orders and less income, and banks might

Figure 3. A garments factory in Bangaldesh prior to COVID-19

reduce credit limits. With this, several textile companies could go bankrupt.

Companies will try to sell textile warehouse stocks (if possible with regard to fashion and season) preferably before producing/ordering new textiles. In the hope of an ending COVID-19 pandemic, the economy will hopefully recover again. Nevertheless, the consumers will not make up for the purchases they have postponed, so any recovery will not catch up the gap that has arisen. All this will reduce the yarn production and hence the cotton demand and will increase the cotton stock — ICAC's projections for 2020-21 show a 12.0% decrease in cotton consumption.

A small, but positive impact might happen for cotton in competition with polyester. Lower cotton prices might slightly increase the share of cotton in textiles again.

Generally, because of the debts due to bridging credits, the textile industry will be less in a position to invest than prior to the COVID-19 crisis, so that even with a recovery of textile production, the impact of the crisis will not be compensated for a long time.

With the given cotton supply, which will not be reduced significantly this year, and the decreased demand, and with the increased stock, cotton prices are expected to stay low for the time being. Already from February to April, the cotton price dropped from approximately 70 cents per pound to 50 to 60 cents per pound. With the area under cotton decreasing in the next season and the cotton consumption rising again, the price will probably not fall any further and can improve slightly over time depending on the economic recovery. These presumptions would certainly depend on any possible recurrence of a 2nd Corona wave.

Governments will not be able to avoid supporting cotton farmers to survive the crisis and to absorb the shock of low cotton prices. There is a need for government policy support through subsidies to compensate for some of the lost income. The textile industry will need soft loan supports to avoid bankruptcy, though it is doubtful, if credits will be sufficiently helpful.

On the other hand, the impact of direct government support for increasing the textile demand may not necessarily meet the stated objective. Households that didn't buy textiles due to the curfew, are not likely to depend on monetary support and will not make up for the missing purchases. And households being strongly affected by the economic effects, will use their budget for existential needs rather than for textiles.

An open question is, how far the crisis will, besides the direct effects mentioned above, impact general aspects of cotton production and trading, sourcing policies and sustainability aspects?

The ICAC Recorder

The Impact of the COVID-19 Pandemic on the Global Cotton Sector

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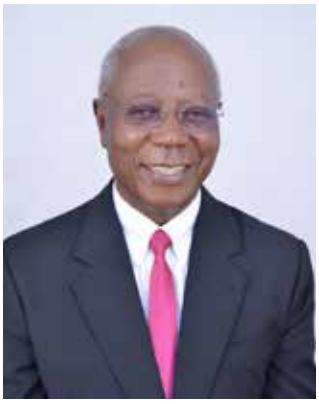

Joe Kabissa: After obtaining BSC in 1975, Kabissa joined the Agricultural Research Service as a food crop entomologist. In 1977, he was transferred to cotton R & D with a focus on pests. In 1993, he became Zonal Director for Research and Training in Lake of Zone after earning MSC and PhD degrees in applied entomology. In 1999, Dr Kabissa was appointed Director General of the Tanzania Cotton Board where he worked until 2010. Thereafter he worked for the Kamal Group of Companies as Executive Director until 2014 when he took up consulting work.

The global cotton sector via its cotton, textile and apparel value chains supports the livelihoods of an estimated 26 million households and up to 250 million people worldwide. By providing employment, income and valuable foreign exchange earnings, the value chains are quite critical for economic development particularly in least developed countries (LDCs). Cotton plays a major role in economic development in Africa: 37 of the 53 African countries produce cotton and 30 are exporters. The economies of LDCs, which collectively account for over 7.0% of the global cotton output, stand to be gravely affected by the COVID-19 driven economic crisis. The pandemic is set to plunge the global economy into a recession that may eclipse the economic damage caused by the Global Financial Crisis of 2007- 2008.

Figure 1. Market yards and warehouses are closed across the world

When COVID-19 became a pandemic between 21st February and 24th March 2020, lockdowns, closure of national borders and social distancing measures were imposed worldwide in order to limit its transmission. Such actions resulted in worldwide disruption of supply chains and as manufacturing activity came to a grinding halt, orders had to be cancelled as workers went home. Consequently, many countries with big ready-made garment sectors have suffered due to cancellation of orders by firms, retailers and brands based in the US, UK and EU. Cancellation and deferral of orders has led to unintended inventory build-ups.

Figure 2. Garment and apparel sales are closed

Figure 3. Small-scale handloom industry is the worst hit

With an expected 12% slump in cotton consumption, stoppage of textile and apparel manufacturing will result in stockpiles of raw cotton rising over and above the already overstocked supply chains. Lint prices have also fallen to just above 50 US cents per pound to date. Given that prices cannot recover anytime soon, cotton growers and ginners stand to suffer income losses as well due to a COVID-19 knock-on effect across the entire cotton

Figure 4. Ginning factories are either closed or have been operating only partially

supply chain. And because the value of most currencies has dropped quite substantially against the US dollar, governments, particularly in LDCs, will find it very difficult to provide emergency disaster lending to cotton businesses unless and until International Financial Institutions can provide some form of a debt moratorium in the case of LDCs (Figure 4).

The COVID-19 saga has no doubt served as a good wake-up call for businesses on the need to review future strategies. Firms are likely to increasingly adopt a business model which emphasises fewer links in the supply chains and with more that are closer to home and thence steadily diminishing their dependence on external suppliers in their chains. For cotton dependent economies in the LDCs, the case for diversifying either vertically or away from cotton and revamping quality has become more compelling than ever before. In other countries such as Australia where growers pride themselves for their high-quality cotton, the COVID-19 pandemic has been nothing more than a mere hiccup in the production cycle as they are absolutely sure to market their lint in spite of the odds.

The ICAC Recorder

COVID-19 and the Indian Cotton Industry-Impact Analysis and Revival Strategies

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Introduction

The global COVID-19 pandemic and the resulting lockdown by several countries will have a lasting impact on all the sectors of our economy and the textile sector is no exception. The Indian textile sector, with a market size of approximately US$150 billion, contributes 7% to the industrial output, 2% to the country's GDP and 15% to the total export earnings. Cotton, with 59% stake in the total textile segment in India, is a widely traded commodity. Cotton production provides livelihood to about 10 million Indian farmers and generates employment for 40 to 50 million persons engaged in its processing and trade. India is also the world's largest producer, second largest exporter of raw cotton and largest exporter of cotton yarn. The Indian cotton textile industry is very diverse extending from several small-scale, hand spun / hand woven enterprises to state-of-the-art automated mills, each with a different degree of resilience. It is imperative to analyse the impact of COVID-19 pandemic on this sector and to suggest measures to mitigate the crisis. The analysis made in this article is based on the current situation and is not conclusive since the pandemic is evolving and the final picture is still obscure.

Cotton production, procurement and consumption scenario

The Cotton Advisory Board (CAB), a representative body of government agencies, forecasted a production of 6.12 million tonnes for the 2019/20 season. The estimate of Cotton Association of India (CAI), a representative body of cotton traders, is slightly lower, pegged at 6.03 million tonnes. As on 24 March 2020, when a national lockdown of 21 days was announced by the Government of India, 4.72 million tonnes of cotton had been procured from farmers by various agencies. When cotton prices started sliding down around mid-January 2020, Cotton Corporation of India (CCI), the Government-run procurement and distribution agency intervened and started purchasing seed cotton at the Minimum Support Price. CCI procured 1.445 million tonnes prior to the nation-wide lockdown announced on 24 March 2020. On 25 March, cotton procurement, ginning and pressing operations came to a grinding halt. Following the exemptions provided by the Government of India to ease the distress among cotton farmers, the market yards/ginners were instructed to purchase cotton from

mid-April by following the stipulated advisories to contain the spread of COVID-19. By the end of April, about 50 per cent of the 210 procurement centres operated by CCI resumed their operations, allowing farmers to sell their produce at the government-declared Minimum Support Price (MSP) of Rs 5,550 per quintal (equivalent to US$ 73.8 for 100Kg seed-cotton) (Biswas 2020). Yet the volume of cotton traded has been low due to stringent pandemic containment norms. Barring a few factories in the central Indian states of Gujarat and Maharashtra, the ginning and pressing factories are yet to start operating or are operating with skeletal staff due to labour shortage and fear of corona virus infection. Ginners also lack adequate capital to operate, as pressed bales are not traded since yarn and garment makers have stopped their operations.

Figure 1. Deserted streets in India due to the lockdown

The CAI, in its update in March 2020 stated that the total cotton availability during 2019-20 season would be 6.996 million tonnes, including 0.544 million tonnes of opening stock, 0.425 million tonnes of imports and 6.027 million tonnes of production. With a likely export of 0.714 million tonnes, the cotton available for domestic consumption would be 5.627 million tonnes. It is assumed that mills would consume 4.896 million tonnes and the small scale and non-mill segment would account for the remaining 0.731 million tonnes. The average consumption rate in India is 0.425-0.46 million tonnes per month. Several mills employ migrant labourers, who have now been displaced following the nationwide lockdown. The mill consumption was almost zero in the last first month of the lockdown period. Conservative estimates point out a possible shortfall of 0.45-0.51 million bales in cotton consumption during this period. A revival in consumption depends upon the exit plan rolled out by the Government of India during the post lockdown phase. The shortfall in consumption is likely to continue even during the first half of the next cotton year. At least it will take about 2-3 months for the mills to function at their full capacity, adding about another 0.5 million tonnes to the shortfall. Taking all these considerations into account the net consumption would be around 4.75 million tonnes during 2019-20. From May 4th, 2020 a phased exit plan has been chalked out by the government and consumption is likely to pick up gradually.

Figure 2. Spinning mills were closed during the first phase of the lockdown

Price trend during the pre- and post-COVID-19 phase

During the current marketing season (2019-20), trading of seed cotton started at an average price of Rs. 5378 per quintal (100 kg) in the first week of September. Prices dropped continuously till November 2nd week to Rs. 4925 per quintal (Table 1). After November 2nd week, prices started stabilising due to the procurement operations at MSP initiated by CCI. This trend continued till January 2nd week and average price of cotton reached to Rs. 5251 per quintal. Soon China emerged as the epicenter of COVID-19 pandemic; shipments to China were stopped and restrictions on international cargo movements came into effect. These actions triggered a decline in cotton prices in the Indian markets. By the end of February 2nd week, seed cotton price fell to Rs. 5174 per quintal and further to Rs. 4966 per quintal by February 20. Prices dropped thereafter to Rs 4779 per quintal by the end of March 2020 (Figure 1). From 25th March 2020 the national lockdown came into effect, markets were closed thereafter and CCI stopped its operations. The price reached to the lowest of Rs 4048 per quintal in the first week of April 2020. International scenario of the cotton prices also showed a similar trend. The Cotlook A Index decreased from 79.06 cents/pound in during January 2020 to 65.45 cents/pound by the end of March 2020. It further nosedived to 59.15 cents/pound on 2nd April 2020 and improved slightly thereafter to reach 65.45 cents/pound by the end of May 2020 (Table 2).

Post-COVID-19 lockdown, market prices will continue to be low as ginners would hesitate to operate their ginneries at full capacity due to the shortage of manpower and low off-take sales. The domestic consumption is expected to

go down, carryover stocks would pile-up. Under these circumstances the prices are expected to be bearish during the next season also. A clear picture would emerge only after the entire harvested cotton is procured and the area planted under cotton next year is available. At present, the international cotton prices are higher than the domestic prices. In India, the ginned cotton rate is in the range of Rs. 39,500-40,000 per candy (each of 356 kg) whereas the international rates are about Rs. 46,000 per candy which is clearly an advantage for Indian cotton in the global markets. Hence there is scope to enhance the exports after the restoration of international movement of cargo. Pro-active interventions from the government are needed to capitalise this advantage.

2019 Week number	Price	2020 Week number	Price
Sep-01	5378	Jan-01	5221
Sep-02	5276	Jan-02	5251
Sep-03	5236	Jan-03	5222
Sep-04	5174	Jan-04	5217
Oct-01	5080	Feb-01	5177
Oct-02	5072	Feb-02	5174
Oct-03	5021	Feb-03	5045
Oct-04	5071	Feb-04	4966
Nov-01	4953	Mar-01	5015
Nov-02	4925	Mar-02	4962
Nov-03	4937	Mar-03	4932
Nov-04	5032	Mar-04	4779
Dec-01	4981	Apr-01	4048
Dec-02	5184	Apr-02	4236
Dec-03	5152	Apr-03	4735
Dec-04	5192	Apr-04	4592

(https://agmarknet.gov.in/PriceTrends/SA_Week_Pri.aspx)
Source: Directorate of Marketing & Inspection (DMI), Ministry of Agriculture and Farmers Welfare, Government

Month	Cents/pound
Oct-19	73.89
Nov-19	74.84
Dec-19	75.84
Jan-20	79.06
Feb-20	76.57
Mar-20	67.99
02-Apr-20	59.15
30-Apr-20	66.5
29-May-20	65.5

Table 1. Weekly prices of seed-cotton (Rs. /100 Kg) from September 2019 to April 2020

Anticipated changes in area planted under cotton during 2020/21

Global area under cotton is expected to decline in 2020/21 by 4% to 33 million hectares (ICAC, Cotton This Month, May 2020). The USDA in its April 2020 Outlook for Cotton Production predicted a 3% decline in cotton area of India during 2020-21. Farmer's decision on the area to be planted under cotton is strongly influenced by the current market price of cotton, expected price realisation during the next crop season, cost of production, expected returns and marketing facilities of the competing crops in the area and Government interventions, including the Minimum Support Price (MSP) offered. It is postulated that the Government may stress on increasing the production of food grains in order to replenish the buffer stock that was extensively used to distribute free ration to the needy during the lockdown period.

Sowing of cotton crop commenced in the North zone of states of Punjab, Haryana and Rajasthan. Both the Government of India under the Crop Diversification Programme (CDP) and the Government of Punjab intend to reduce the area under water intensive and air pollution aggravating paddy (stubble burning) crop with cotton or maize. The state of Punjab has targeted an additional area of 0.12 million hectare to be diverted from paddy to cotton. Farmers of North zone realised good price (Rs. 5000-5500/q of cotton) during 2019/20 season as most of them sold their cotton before the onset of COVID-19. Post pandemic, there was an exodus of skilled migrant labour with experience in transplanting of paddy seedlings, compelling farmers to consider substituting paddy with cotton wherever possible. Farmers in Punjab, Haryana and Rajasthan are seen moving away from paddy and guar (cluster-bean) towards a preference for cotton this year because of higher remuneration from cotton and the labour shortage for paddy transplantation (Vora and Kulkarni, 2020). On the flip side, a delay in harvesting of wheat due to late season rainfall and restrictions imposed by the lockdown and a delay in the release of canal water for irrigation may extend the sowing window of cotton to mid-May or beyond. The late sown crop is likely to be predisposed to whitefly damage, warranting extra vigil during the season. In the southern part of Rajasthan, some farmers who realised lower price from cotton this year (2019-20) are likely to opt for pearl millet during the forthcoming season.

The competing crops to cotton in the Central and South zone are groundnut in the state of Gujarat; pigeon-pea and soybean in Maharashtra, Madhya Pradesh and Telangana and maize in Tamil Nadu and Karnataka. Cotton prices during the peak marketing season in these zones decreased below the MSP necessitating CCI to intervene and purchase cotton at MSP. About 80% of the produce was sold before the lockdown.

A shift from cotton to maize or soybean seems less likely due to the fact that soya meal and maize are used as feed for poultry industry and COVID-19 has severely hit this industry across the globe. The fear of fall army worm (*Spodoptera frugiperda*) infesting maize crop is another reason that could dissuade farmers from shifting to maize. The prediction of a normal monsoon and Government interventions to purchase cotton at MSP (which has been increased by 4.95% on 1 June 2020) may continue to lure farmers towards cotton. But the anticipated fall in demand

and price of cotton, may tempt some cotton farmers to opt for groundnut or pigeon pea. Given the prevailing situation, a slight reduction in the area under cotton to 12.0 million ha during 2020-21 from 12.7 million ha during 2019-20 cannot be ruled out. A bountiful harvest during 2020-21 crop season could actually end up with a massive surplus of cotton.

Input and labour availability for the ensuing cotton crop season

Around 50 million packets of seeds (450g *Bt* seeds plus 120g Non-*Bt* seeds) are sold annually. Being an essential commodity, the processing and packaging of seeds were exempted from the lockdown. Despite hurdles, the seed industry ensured that the requisite quantity of seeds reached the retail outlets in the states of Punjab, Haryana and Rajasthan before April 15, well before the commencement of sowing. The Indian Railways provided exclusive parcel vans to transport cotton seeds from Salem in the southern state of Tamil Nadu to Bathinda in Punjab in the last week of March, 2020 (Arivanantham, 2020) and to Haryana in the first week of April during the lockdown (since road transport was closed), to ensure timely availability of cotton seeds. Despite partial mechanization, several activities in the seed processing, testing and packaging continue to be labour intensive. The seed industry is making extra efforts like shifts, enforcing physical distancing and following the recommended sanitisation and hygiene protocols to contain the COVID-19 pandemic and yet making sure that the seeds reach the outlets in the states of Central and South zones before the monsoon. There are still some bottlenecks regarding labour for loading and unloading and transportation of the produce across states. Farmers are hopeful to receive cotton seeds for sowing by June.

During the early period of COVID-19 lockdown, the fertiliser industry faced logistic (transportation) hurdles, build-up of inventories and labour shortages at several production plants. The Government of India, under the essential commodity act allowed the functioning of fertiliser plants and transportation of fertilisers. The Government is also constantly monitoring and reviewing the production and distribution of fertilisers and are optimistic of avoiding shortages during the ensuing season.

Cotton is a labour-intensive crop and around 110 days of labour are required to cultivate a single ha of cotton (Kranthi 2014). Barring the states of north zone, where its cultivation is partially mechanised, all the cultural operations, except tillage, are done manually in the Central and South zone. Thankfully, unlike paddy cultivation in the north zone that is heavily dependent on skilled migrant labour, all the operations in cotton are performed by local labour. Hence, labour availability per-se may not be an issue. But during the crop season, maintaining physical distancing, ensuring sanitisation and adopting hygiene protocols would be a difficult task. This could increase the time taken for different farm operations and increase the cost of labour. Government agencies are issuing regular advisories regarding the precautions to be taken during farm operations to contain the pandemic.

Impact of COVID-19 pandemic on other segments of cotton supply chain

The global response to contain the COVID-19 pandemic in the form of closure of spinning, weaving and garment industries, partial layoffs, salary cuts of employees, disruption of skilled and unskilled workers, cancellation/deferral of shipment orders, build-up of inventory etc. are bound to have cascading effects along the value chain on the supply front. On the demand side, lower disposable income, reduced footfalls into malls and retail outlets etc., subdued social functions (marriages etc.) would pull down the demand for readymade garments, cloth and home textiles. The possible impact across the value chain is summarised below:

Cotton yarn segment

Yarn accounts for 28% of the Indian textile trade (Care ratings, 2020). Even before the pandemic, the yarn industry has been plagued by a decline in exports (KPMG 2020). During April 2019 to January 2020, cotton yarn output declined by 4% to 3.4 million tonnes (Care Ratings 2020). In the first 3 quarters of the financial year (2019-20), the output of blended yarn increased marginally by 1.6 % to 1.27 million tonnes. China is major importer of yarn from India and about 45% of the exports have been to China. Normally, India exports 20-25 million kg of yarn every month to China (Muthuveeran,2020). From January this year, the subdued demand from China, due to closure of garment industry there, resulted in a 3.4% decline in the price of yarn in the domestic market, but the domestic industries also faced shutdown and could not benefit from the low yarn prices. Bangladesh, Vietnam, South Korea, Columbia and Turkey are other destinations for Indian yarn and export to these destinations too were disrupted by the pandemic. The disruption in the global and domestic market due to COVID-19 could further reduce production of yarn by 14%-15% over the next three quarters (Vastani 2020). The gradual opening up of garment industry in China (post COVID-19) has re-started shipment of yarn from India, offering a glimmer of hope to this segment.

Fabric segment

Between April and November 2019, India exported cotton fabrics worth US$3.99 billion (IBEF 2020), a marginal improvement over the previous period due to lower yarn prices and enhanced demand from Bangladesh. Post COVID pandemic, the situation

reversed due to low domestic and export demand (Rathi 2020). Several small and medium enterprises that operate in this segment were badly affected by the national lockdown and are seeking Government interventions for their bailout. Since fabric is an intermediate product, subdued export and domestic demand of readymade garment and home textile segments would continue to adversely impact this segment over the next three quarters (Vastani 2020).

Ready-made garments segment

Europe and USA are the main destinations for Indian apparels, accounting for 60% of the apparel export. Between April to November 2019, India exported made ups worth US$5.58 billion. Severe spread of COVID-19 has reduced demand, enquiries and orders from major retailers and brands from these countries. Indian companies are likely to pile up inventories and may be tempted to offer huge discounts to clear up the stocks, post pandemic. However, the industry is hopeful that post COVID-19 pandemic, India would emerge as a favoured nation over China for sourcing of apparels/readymade garments and markets may pick up in medium term. Several apparel brands and retailers are cancelling or postponing their purchase orders thereby impacting the livelihood of millions of garment workers. In the short run, sources from the Industry predict an 18 to 20% decline in the apparel segment because of the lockdown induced reduction in global and domestic market. Moreover, small and medium enterprises, with less financial backup, that constitute 80% of the garment industry are worst hit by the lockdown.

Price of Crude oil and man-made fibre production

Crude oil is the raw material for the production of PTA (Purified Terephthalic Acid) and MEG (Mono Ethylene Glycol) that are used as raw materials for the production of polyester fibre. To provide easy access to raw materials, the anti-dumping duty on PTA was abolished in the Union budget, 2020-21. India imports huge amount of PTA and PSF (Polyester Staple Fibre) from China, and COVID-19 led disruptions caused shortage of raw material for man-made fibre production. Reduced oil demand due to COVID-19, crashed the price of crude oil from US$ 65 per barrel in Dec 2019 to US$ 50 per barrel by March 5, 2020 and further to US$ 26.3 by April 10, 2020 (Kalyanaraman, 2020). With the reduction in price of crude oil, the raw material would be cheaper, operational costs would reduce and the price of man-made fibre is expected to decrease, offering fierce competition to cotton and other natural fibres. But a reduction in demand for man-made fibres is likely to play a spoilsport in the short run due to COVID-19.

Interim relief measures announced by the Government to safeguard the industry

The Government has announced some immediate relief measures to alleviate the suffering of the farmers and workers during the lockdown period.

- Cash transfer and additional supply of food grains free of cost for three months.
- Relief camps for migrant workers employed in industries and construction sites.
- Advance instalment of Rs 2000 (US$ 26.5) per account holder under PM KISAN Yojana to enable farmers to purchase seeds and other essential farm inputs.
- Extending the last date for repayment of crop loans from March 31 to May 31 and retaining the benefit of interest subvention and incentives for timely repayment.
- Exemption of farm operations including custom hiring of machinery from lockdown.
- Opening of market yards for procurement of agricultural produce including cotton and restart of the procurement of cotton by CCI.
- Exemption of production, transport and marketing of seeds, fertilisers and pesticides from lockdown.
- Waiver of penalty/late fee for delay in payment of GST (Goods and Service Tax) .
- Clearance of refund of garment exports to the tune of Rs 3000 crore (US$ 397 million).
- Waiver of container detention charges on import and export shipments.
- Permission for restart of ginneries, spinning mills, power looms in some areas in a phased manner.
- Reduction in repo-rates and cash reserve ratio of the Central Bank (Reserve Bank of India). Allowing commercial banks to extend loan repayment schedule and offer moratorium for up to three months. These steps would help the textile industry to meet their funding requirement amidst the COVID-19 crisis.

The Ministry of Textiles, Government of India, has constituted five Technological Task Forces led by Indian Institutes of Technologies (IITs) to address both immediate and medium term action plans to revamp the textile industry and kick start the economy in the post COVID-19 situation.

Suggestions to revive the cotton textile industry

The COVID-19 pandemic and the lockdown to contain the virus took a heavy toll of the textile industry. With partial

easing of the lockdown it is time to restart. The industry may take 12-18 months to reach business as usual and one hopes that there is no second spike in the virus infection. The success lies in converting the crisis into opportunity. Both demand and supply sectors must be addressed simultaneously.

1. With lesser area, India must produce more cotton by embracing better, low cost management strategies. When yield increases, the unit cost of production decreases and Indian cotton will become more competitive. The surplus area can be diverted to other crops to ensure food and nutritional security. Reduced production cost would also offset the likely drop in profit, in case the price of cotton remains low next year due to a reduction in overall demand. Intercropping with legume pulse (pigeon pea, green gram, black gram or cowpea) or oilseed (groundnut or soybean) could be another risk aversion strategy.
2. Area planted to cotton is likely to decline in the US, Pakistan, Australia and some other cotton growing countries. The production of cotton will also shrink. India needs to encash this by improving its volume of business in raw cotton, yarn and made ups. Massive investment would be quickly needed. New trade destinations must be explored.
3. Several segments in the cotton value chain are labour intensive. Therefore, the return of migrant labour from hometown to their workplace must be ensured. Better working conditions, hygiene and sanitisation, health insurance medical facilities etc. can be offered to the workers employed in mills.
4. India is heavily dependent on China for the export of cotton yarn and import of PTA. The textile industry in China and Bangladesh are in deeper crisis. India must seize this COVID-19 crisis into an opportunity to export beyond the traditional destinations *viz* China and Bangladesh for raw cotton and yarn, and Europe and USA for readymade garments. India also imports substantial quantity of accessories like zip fasteners, buttons, needles, hangers etc. needed for its garment industry from China. This is an opportunity to set-up in-house units to produce these accessories.
5. Post COVID-19 pandemic countries would increase investment in health care industry. Indian textile industry can diversify its portfolio to include masks, personal protection equipment, towels, nanocoated anti-microbial coated bed sheets, mattresses; disinfectant wipes etc. whose demand is bound to increase. Fortunately, India has the capacity to produce cotton of the desired quality to meet these diverse end uses. A huge export potential can be tapped.
6. India needs to invest on technical textile industry, surgical cotton industry and by on product utilisation, so that value of the whole crop is maximised. The surplus cotton, exceeding the mill consumption, can also be used to provide value added products (agro-textiles, geo-textiles etc.).
7. The COVID-19 pandemic has shattered the economy of hand spun, hand woven (handloom) sector. A special package can be provided to this sector to improve the livelihood of several thousands of artisans. In a recent initiative by the Ministry of Textiles, the IIT Kanpur (Uttar Pradesh) and IIT Bhubaneswar (Odisha), have been entrusted with the responsibility of reorienting technologies for weavers and handicraft artisans.
8. The COVID-19 pandemic has reduced the prices of several raw materials and machinery used in the cotton industry. Companies having capital can acquire and accumulate raw materials and stock them until the end of lockdown and release them as the prices turn favourable. Hedging of raw material prices is another option.
9. Foot falls in retail outlets and malls would continue to be low even after the lockdown is lifted because of the lingering fear of infection among consumers. Brands and retailers can aggressively reach out to consumers through e-commerce channels/online marketing avenues, digital transaction to market readymade garments, home textiles etc. Consumer acceptance of these channels would increase post pandemic.
10. Stakeholders along the supply chain starting from brands and retailers at the top must help their suppliers by honouring the supply orders, payment and delivery terms and also offer reasonable flexibility to enable their suppliers adapt to the 'changing normal' in the working conditions due to COVID-19. Otherwise the cotton farmer at the bottom end of the supply chain, who is the most vulnerable, will be severely hit.
11. Global demands for textile products are likely to remain subdued. India needs to improve its domestic consumption. Expected decrease in the employment opportunities would lead to decrease in the incomes of Indian population which adversely affect the demand for textiles. Therefore, government needs to explore opportunities to supply clothing materials to poorer sections of population through Public Distribution System.

Conclusion

The COVID-19 pandemic has disturbed the demand-supply scenario of every segment of textile industry across the globe and the demand for cotton has been decimated during the lockdown period. Massive reduction in the demand for raw cotton, yarn, fabric, readymade garments and home textiles will continue to severely impact the global textile trade for several months. Fortunately, as of now, the

Figure 3. Textile industries have begun operations

Figure 4. Textile printing in progress

magnitude of impact for India is lower than many other countries. With the phased re-opening of the economic activities, the textile industry must quickly align with the changed situation. The pace of recovery depends upon how resilient the economy of the affected countries are, what impetus would be given to revive the textile industry and how quickly the different segments of the industry adapt to the new normal, post COVID-19. The Government of India is preparing sector specific action plan to alleviate the hardship faced by the textile industry. A quick recovery is envisaged if all the players in the supply chain join hands, share and support the burden of the less privileged segment, particularly the 10 million cotton farmers of India.

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The ICAC Recorder

COVID-19 Impact on Indian Cotton

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Introduction

India imposed a lockdown from 24 March 2020 due to the global pandemic of COVID-19. The lockdown is still in operation at press time (10 June 2020) in the country in different forms. The day the lockdown commenced in India, the first and foremost casualty appeared to be the farming sector, which comprises more than half of the population of the country. The first Prime Minister, Mr. Jawaharlal Nehru, said, 'Everything can wait but not agriculture', realising that the farm activities are bound by times, dates, or months and any lockdown on agricultural activities will rebound in reduced production, productivity, profitability and sustenance of the farming community and landless labourers (Bera, 2020). Thus, the ongoing lockdown due to Covid-19 in India since 24 March 2020 is expected to impact agriculture in general including cotton.

The government is often worried about the shortages of food and feed as food security is more important to planners than fibre availability. Fortunately, there are huge stocks of food grains and there is no immediate worry on this count. Therefore, the Government announced some sleek measures to ease the tensions of poor people. The Government initiated measures to provide monetary aid to make cash available to the poor and marginalised sections of the society to benefit approximately 800 million people in the country (Economic Times, 2020). Furthermore, to prevent hunger, ration supplies are being provisioned to meet the basic food and legume requirements for the next three months. Adequate care has been taken to provide support for the elderly, the jobless and the youth in the wake of large-scale shutdown. Wheat and rice have been provided to the poorer sections through ration shops at subsidised prices of US$0.026 to US$0.04 per Kg. While the government has been able to ensure food supplies and distribution to solve consumer problems, prices have slumped because of uneven distribution and disruption of the markets, thereby resulting in heavy losses to the producers. Farmers are distraught with the losses caused by the lockdown. Cotton farmers are more vulnerable to the crisis, as they can neither stock the produce due to space problems, nor sell the produce due to low prices, because the entire value chain is disrupted. This paper analyses the impact of COVID-19 on the cotton harvested prior to the lockdown and the ensuing sowing operations in the rainy season of 2020.

Cotton Economy of India

Cotton is very important crop grown commercially in 11 states of India. It occupies 12-13 million hectares of area in the country and is grown by about 8 to 10 million farmers. Ecologically there are three zones of cultivation. The north zone comprises of the States of Punjab, Haryana and Rajasthan, while the south zone constitutes of Tamil Nadu, Andhra Pradesh, Telangana and Karnataka. Nearly 67% of cotton is cultivated in central zone comprising of Maharashtra, Gujarat, and Madhya Pradesh. About 65% of the cotton is grown under rain-fed conditions mainly as rain-dependent while the rest of the cotton is flood-irrigated or drip-irrigated. Current estimates show that about 10% of Indian cotton is under drip irrigation. In north zone, the crop is sown in mid- April and in Tamil Nadu it is sown in August-September months. In the rest of the country it is sown with the onset of monsoon rains in June. The diversity in terms of cultivars and cultivation practices of cotton is unique to the country (Mayee, 2015; Mayee, 2019; Blaise and Kranthi 2019). It is also the first crop in India, where genetically engineered technology (GE) or commonly referred as biotech crop has been commercialised in the form of insect resistant *Bt*-cotton (Choudhary *et al.,* 2014). In the last decade, cotton production scenario has undergone dramatic changes and Indian cotton has not only dominated the International production system but attracted the attention of all global players in the commodity for its persistent growth. The assured production of 35 million bales of 170 kg each after 2005-06, ensured export of raw cotton because the domestic consumption capacity is only around 30 million bales. It is estimated that this year the production could reach 36 million bales while the maximum consumption by textiles and surgical industry may be around 29 million bales. Multiple uses of cotton as food (edible oil), feed (de-oiled cake) and fibre increased over the years. The value of cotton by-products from cotton seeds and cotton stalks is also high in India. Because of high production of seed oil, animal feed as de-oiled cake, linters and stalks for pellets/briquettes and particle boards, the rural economy received a major boost through additional income to farmers which helped the rural employment, rural industrialisation and conservation of natural resources. The *Bt*-technology assisted the domestic seed industry to grow and the vibrancy is seen from the fact that nearly 50 million packets, each containing 450g *Bt*-seeds plus 120g non-*Bt*-seeds for refuge planting are required annually to meet the farmers demand of seed. About 97% of the planting cotton-seed requirement met by the private seed companies.

COVID-19 Pandemic in India

SARS-CoV-2 or the novel corona virus inducing COVID-19 has put a third of world's people under lockdown and brought several major economies of the world to a grinding halt as it spread like wildfire from country to country in just a short span of time. Starting from the city of Wuhan in China in December 2019, COVID-19 has spread to nearly 181 countries across the world infecting millions of people with a mortality rate ranging from 1.5 to 5% as of April 1, 2020 (John Hopkins, 2020). India is no exception and hence on 24th March, the Prime minister of India ordered a complete lockdown of the nation. The pandemic is already wreaking havoc on the world's physical and

economic health but India being an intensively agrarian economy is also experiencing a different kind of stress on its 50% population comprising of farmers. As the 2019-20 cotton cropping season comes to an end by April and the new season of 2020-21 commences from April farmers are having to face additional difficulties resulting as fallout of the pandemic. Cotton farmers have to mitigate two major challenges; (i) sale of the harvested produce and (ii) procuring inputs and cultivation in the ensuing rainy season.

Challenge One: Cotton 2019/20

The current estimate of cotton production in 2019/20 is 35.4 million bales, out of which about 9.54 million bales have been procured by the Cotton Corporation of India (CCI) of Government of India until 28 May 2020 (Priyanka, 2020) and farmers were paid at the Minimum Support Price (MSP). After the Corona threat in mid-March, cotton sales were disrupted and then came the lockdown which closed the ginning factories which are the main hubs for the farmers to sell their produce and cotton sales were stopped abruptly. The lockdown resulted in situation wherein about 20% of the current year's crop was either stuck up in fields without being harvested or stacked in farmer's homes, because they were not able to transport or sell it (Cogenesis, 2020). Cotton prices dropped by 3-5% by the end of February as shipments of commodities to and from China had come to a halt. Decrease in cotton export will further put pressure on domestic prices of cotton yarn. However, there is always a ray of hope. The recent branding of Indian cotton could help in creating a special market in exports. Last year, the CCI launched a special brand called 'HIRA' (High Reliable Attributes), of Indian Cotton specifying quality having less than 1.7% trash, low moisture and assured quality. Even if the CCI manages to trade 10 m bales of HIRA, the Indian cotton brand will establish itself in the world market and could ultimately benefit Indian farmers. One danger still hangs over the head; if the pandemic is not contained soon, China's demand for cotton is likely to suffer and the burgeoning stocks could depress domestic prices. Cotton farmers and the stakeholders in value chain also benefit from by-products of cotton like; vegetable oil, oilcake, linters, pellets and briquettes from cotton stalks. These businesses have also suffered due to the lockdown. Fortunately, the recent amendments of the governments have permitted the crushing of cotton seeds for oil and cake (Economic Times, 2020).

Challenge Two: Cotton 2020/21

Initially the situation appeared grim for the ensuing rainy season called *kharif,* because of the possible blockage in availability of inputs such as seeds, fertilisers, manures, pesticides, machinery, labour etc. that are essential for sowing operations. Sowing at the right time is critical for high yields in cotton. The lockdown imposed on 24 March 2020 posed two major challenges to seed distributors. The first one was the immediate supply of nearly 6.5 million *Bt* cotton seed packets of 450 gm each to the north zone of Punjab, Haryana and Rajasthan before mid-April when farmers undertake sowing after the harvest of wheat. The second challenge was the distribution of about 4 million packets of seeds across the entire length and breadth of central India and parts of southern India before the first week of June 2020. Seed production is taken up mostly in the southern states of Tamil Nadu, Telangana, Andhra Pradesh and Karnataka. Some seed is produced in Gujarat and Maharashtra, too. Nearly 97 % of *Bt*-hybrid cotton seed is supplied by private seed companies. The process of seed processing involves a series of operations commencing with the harvest of raw seed-cotton and ends in the supply of 450 g labelled packets though approximately about 90,000 retail sellers. First, the seed-cotton is ginned to separate it from seed in ginning machines. The seeds are then delinted to remove the linters and graded on the basis of size, weight. These are mostly mechanical operations. However, subsequent processing like removal of damaged seeds is done by labourers in a time-consuming process. The seeds are then tested for germination, inspected for quality, treated with pesticides, packed and dispatched across the country. Companies producing cotton seeds involve distributors and dealers to ensure that the seeds reach practically all cotton growing villages through retailers. Lockdown due to Corona virus has greatly influenced the seed processing operations. Though seed-processing started in a normal manner in December, the lockdown halted all operations in March due to which about 5-10% of the seeds were stuck with the seed-producing farmers. Since March, the peak season for grading and packing was affected because of labour unavailability required in the processing plants. The time schedule of making the seed ready for dispatch coincided with the peak period of lockdown. Though many standard companies complied with all the prescribed safety precautions such as maintaining physical distances between workers, providing masks and adherence to all the safety measures suggested by the medical authorities of respective states, seed processing was affected nevertheless (Fernandes, 2020).

Government Support in the Wake of Lockdown

The government shutdown most of the industries, except those covered under the Essential Services Act such as the agro-industries, pharma, health care, telecom, banking, etc. However, shortage of labour force has affected the normal functioning of these industries. Keeping this in view and the on-going harvest of the winter season crops, the Government exempted farm workers and farming operations from the ban, with a caveat that they follow health care tips and social distancing. Further, various markets involved in procurement of agriculture products and sale of seeds, fertilisers, pesticides were exempted from the

lockdown restrictions by the state governments (Tripathi, 2020).

Initially it was felt that the entire process of cotton sale and seed supply would be disturbed but thanks to the government efforts, normalcy has been restored in the agriculture sector and farmers have been least affected by the general lockdown. Due to the restrictions imposed on movement, many farmers were not able to either sell their produce or receive payment. To address the problem being faced by the farming community, the government introduced extension of interest subvention and prompt repayment incentive benefit up to 31 May 2020 on short-term crop loans up to Rs 30,000 (US$ 400). The government is also providing concessional crop loans with just 2.0% per annum interest subvention to banks. Immediately within a few days of the lockdown, the government realised the significance of timely farm operations that would be required for the coming season and eased restrictions on transport and sale of agricultural inputs and products. The government permitted opening of all agricultural-input-shops in rural and urban areas and sales of seed, fertiliser, pesticide, with priority instructions to civil and police authorities not to harass farmers and the farm input suppliers. A classic case of movement of cotton seeds from Tamil Nadu to Punjab (Hussain, 2020) is worth quoting in this crisis. Indian Railways provided exclusive parcel vans 24x7, to trader associations and manufacturers to move their consignment in a short span of time to destinations that were 3000 to 4000 km away to meet the demands of Punjab farmers. Sowing operations have been efficiently completed by the first week of June. These government actions are commendable and provide a reassurance to farmers that their business of farming would go on unabated.

Figure 1. Spinning mills have been shut, except for resumption of partial activity

The Processing Hurdles

Seed-cotton after harvest from fields is not normally stored by the farmers because of the large volume of produce and is sold off as early as possible. The first step in processing commences with ginning to separate the lint from the seed. There are large number of ginning factories in India, but very few have a composite infrastructure to facilitate pressing the lint into bales of 170 kg each. During the last decade, there has been a lot of improvement in installation of new ginning and pressing factories with modern equipment and automation. However, the entire process of ginning and pressing involve many steps such as packing, stripping, marking and loading which require a large amount of labour. The first phase of the lockdown led to closure of ginning factories because of which nearly 15-20 % of the cotton harvested in February and March was stuck with farmers. Moreover, the social distancing regulations made it difficult for labour operations and thereby handling of bales. The first steps of disruption in the supply chain and the value chain commenced at this stage.

Figure 2. textile factories are closed across the country. A few opened with some activity recently.

Further the panic situation created by the COVID-19 pandemic and the subsequent lockdown has hit hard the core of textile industry i.e. the demand. The overseas and domestic demand for textile products nosedived and hence the textile industry came to a grinding halt. India has more than 2000 spinning mills with different spindle capacities. The apparel industry is also severely hit. Stores are closed and trade has halted. Buyers are cancelling or postponing their orders in view of big inventories with them. Yarn export was down by 30-35% in January-February this year even before the effects of COVID-19 were pronounced. USA and European Union are the biggest markets for textile exports. Unfortunately, both are reeling with a large number of COVID-19 cases and high mortality rates. India's textile and apparel sectors contribute 4.0% to the global market, 7% to the industrial output of the country in value terms, 2.0% to the GDP and 15% to India's export earnings. This sector is considered as the biggest employment generator after agriculture. It employs about 105 million people in various activities; majority of them as daily wage workers.

Therefore, the closure of factories has resulted in layoffs. Most of the garment units in India are micro, small or medium enterprises (MSME). It is also predicted that even when the pandemic subsides the textile and apparel manufactures will take lot of time to resume business as usual. All the related associations of cotton such as, the Confederation of Indian Textile Industries (CITI), Clothing Manufacturers Association of India (CMAI) are seeking concessions and financial packages from Government. Besides the basic interest rate reduction and extension of soft loans; the associations are demanding moratorium on principal and interest amounts for four quarters and similar such financial concessions. They feel that unless the government gives stimulus packages, the sector shall not be able to rise once again even when the shutdown relaxes. It is matter of great satisfaction that majority of cotton farmers were able to sell their cotton before March and received due returns before the lockdown was imposed. However, the value chain remains broken as of now and if it continues to be disrupted through the year, the 2020 season may present an ordeal for farmers. Hence the government must seriously develop mitigation plans to support the cotton value chain to see them through this pandemic.

Figure 3. Small-scale factories have been the worst hit.

Epilogue

But for the government interventions, the ongoing lockdown due to the pandemic in India could have adversely impacted agricultural operations due to late harvesting, delayed land preparation, inadequate input supplies and thus reduced farm incomes. Fortunately, both the governments at the centre and in the states woke up in time to the importance of timely agricultural practices and introduced several measures to restore normalcy of farm operations. The needy farmers were given access to easy credit and their loan repayments extended. Removing the restrictions on transport and sale was one of the most welcome steps to make available the agricultural inputs such as seed, fertiliser, pesticide and implements. Agricultural inputs were considered as essential commodities and shops selling these items were permitted to remain open during the lockdown period with caveats of social distancing and health care. The initial fear that cotton farmers would suffer due to the present crisis has been negated by the government's positive interventions and now it is expected that the upcoming cotton season shall be as normal as any other.

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The ICAC Recorder

Possible Impact of COVID-19 Pandemic on Cotton Cultivation in North India

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In India, cotton is cultivated in three distinct agro-climatic zones; North zone, Central zone and South zone. Punjab, Haryana, and Rajasthan are the three North Indian cotton growing states. Of the four cultivated species of cotton, only Upland cotton (*Gossypium hirsutum*) and one of the two Asiatic cottons (*G. arboreum*) can be cultivated in this region. Presently, Upland cotton is grown predominantly in this zone as is the case in rest of the cotton growing states of the country. Most of the cotton cultivated in this region is irrigated. Based on the average of last 10 years, cotton in this part of the country was cultivated on approximately 1.5 million hectares (ha) which constitutes about 12.3 per cent of the national cotton area; with an average contribution of nearly 14 per cent to the total cotton production of the country. This zone recorded higher average cotton productivity (572 kg lint ha^{-1}) than the national average of 506 kg lint ha^{-1} during this period.

Wheat, an important *rabi* (post-monsoon) crop in North India, is cultivated in approximately 3.5, 2.5, and 3.0 million ha in Punjab, Haryana, and Rajasthan, respectively. Due to prolonged winter and inclement weather conditions during the 2019-20 *rabi* season, harvesting of wheat was delayed by 1-2 weeks in these states. A substantial area of cotton in North India is planted in the first fortnight of May, though planting of cotton continues till May end. Cotton areas where quality of the underground water is poor, depend on the availability of canal water for pre-sowing irrigation. Planting of cotton in the fields located at the tail end of canals usually gets delayed. Also, rainfall after the planting of cotton seeds results in formation of crust leading to poor emergence of seedlings which necessitates re-sowing, thus delaying the cotton crop and adding to cost of cultivation as well. Late planted cotton is more prone to the attack of leaf hopper, whitefly and the dreaded cotton leaf curl disease (CLCuD) resulting in stunted plant growth and severe losses in cotton yields and reduction in fibre quality. However, the delayed harvesting of wheat and the countrywide lockdown due to Covid-19 did not affect the sowing of succeeding cotton crop. All the inputs including cotton seeds have been made available to the farmers. More than 90% of cotton planting was completed by the end of May.

Rice is the most important *kharif* crop of Punjab and Haryana. It is grown on about 3.0 and 1.5 million ha area in these states, respectively, whereas in Rajasthan it is cultivated on around 0.2 million ha. Rice crop is heavily dependent on the manual transplanting of seedlings. Migrant workers from the states of Bihar and Uttar Pradesh arrive in North India between the last week of March to first week of April. They help in harvesting of wheat and other agricultural activities and then stay until the transplanting of rice seedlings is over. After that, intensive work force is not required during rest of the rice crop season. However, due to the COVID-19 pandemic, migrant labourers are unlikely to be available this season. Many farmers resorted to direct seeding of rice circumventing the need for rice seedling transplantation. Due to the shortage of skilled labourers required for rice, cotton acreage increased significantly in Punjab to reach 0.45 million hectares by the 5 June.

The ICAC Recorder

Challenges to Cotton Value Chain during Pandemic COVID-19

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The COVID-19 pandemic has been having different impacts on agriculture in developed countries and developing countries. Developed countries have large-farm-size holdings and agricultural operations are mechanised whereas in developing countries the farm holdings are small, and operations are dependent on hired labourers or by pooling labourers. While large-holding-mechanised farms appear to have been least affected by COVID-19, the preventive lock-down and social distancing has had a very crucial effect on the day to day field operations in developing countries, especially since the farm operations and rural economy are largely dependent on labour participation.

Due to the lockdowns in different developing countries, a vast section of the population that was slightly above the poverty line slipped down below the poverty line and the Government had to support a larger number of people; more than it had expected. The load on governments was diluted slightly, thanks to philanthropists and social workers who came out and supported a substantial number of families with their resources.

The Government of Pakistan has been keen to ensure a seamless supply of food items — especially of perishables like vegetables and dairy products. The Government introduced the Anti-Hoarding Ordinance and other regulations mainly to discourage opportunists and hoarders, thereby ensuring that the prices were stable. The Prime Minister has been closely monitoring the food security situation as a result of which buffer stocks of each essential food items were maintained. Imports of foodstuff were facilitated at ports and in transportation so that the consumers could get a consistent supply of food items. Agriculture is in general an integrated and diverse business in Pakistan. Small and medium-size farm holders do not rely on a single crop but depend on vegetables, livestock and horticulture for regular income and livelihood. The lockdown and closures of main businesses like restaurants, catering services, and wedding halls reduced the food demand drastically and had a very severe impact on the prices of perishable produce like vegetables and dairy products. For example, the retail price of fresh tomatoes dropped to Rs. 15 per kg from Rs. 60. Most of the producers were unable to recover the harvesting or transporting costs. On the other hand, the demand for dry food items spiked up because of panic buying.

COVID-19 has severely impacted agriculture including cotton sowing operations in Pakistan. In many countries of the northern hemisphere, wheat harvesting starts from the second fortnight of March and lasts until July. In Pakistan, wheat harvesting had just started in Sindh province, in early April when the first lockdown was announced by the provincial Government of Sindh followed by other provinces. All agricultural operations were affected due to the lockdown. Farmers were facing issues of transport, movement of harvesting machinery, repair workshops, spares stores, etc. The most serious challenge was the movement of farm laborers, as local transport was also shut. However, the government soon granted a special permission for the movement of agro-machinery, exemption for the opening of workshops, and auto stores to ensure the supply of spare parts. The special permission came with strict guidelines on social distancing, personal protection and other standard operating procedures (SOPs). Wheat harvesting is quite a labour-intensive activity. Severe weather conditions and lack of awareness in farm labourers may lead to

poor compliance of the recommended protective measures against COVID 19.

The Agriculture Department initiated special training programs on safe agricultural production practices, social distancing, washing hands frequently and how to deal with COVID-19 patients or suspected patients. Farmers' training in variety selection, weed management, production technologies, and pest scouting were performed before the cotton season. Similarly, refresher courses on cotton production strategies were conducted for field staff of Agriculture Department. Farmers training sessions were performed online, whereas the field staff was also trained either online or in small groups. Social media awareness campaigns and Tele-Cotton SMS based message service for growers have become very popular during the lockdown period and the recovery phase. Various social media platforms generated healthy interactive discussions, especially through interactive guidance by experts and researchers.

About 70.0% of the cotton crop area is in Punjab and the rest in Sindh province. Cottonseed distributors were facing difficulty for the movement of seed and it's marketing. However, a few companies facilitated door delivery to circumvent the problem. The overall pace of cotton sowing was normal and COVID-19 did not have any impact in sowing except un-expected rains that caused delays in some areas of Punjab. Since cotton is sown after wheat harvest on more than 70% of the area, any delay in wheat harvesting has an impact on cotton sowing. Late sown cotton results in low yields due to increased vulnerability of the late sown crop to insect pests and diseases. More importantly, studies showed that delayed sowing of cotton makes the crop prone to the dreaded Cotton Leaf Curl Virus (CLCV); therefore, early sowing is considered to be the better. Timely availability of pesticides is crucial for pest management, especially to control the most damaging whiteflies. China is the main source of pesticides in Pakistan. When COVID-19 was at its peak in China in March, pesticide manufacturing/formulating industries and importers in Pakistan anticipated shortage of raw material and formulated pesticides for cotton, sugarcane, and rice. However, China opened its markets in April and with ease in supplies from China, the private sector secured adequate fertilisers, pesticides and also raw materials that were required to manufacture pesticides and fertilisers of pesticides needed for major Kharif crops. Pesticide and fertiliser dealers received an exemption from the lockdown and were able to provide services by following stringent personal protection measures.

The textile value chain had been hit very badly because of lockdowns and the subsequent isolation measures to combat COVID-19. The supply chain and value chain industry suffered from cancelation of orders, and non-compliances mainly because transport and ports were shut. Labour shortages and workers' safety emerged as key challenges to the manufacturing sector and exporters. Export-oriented industries were given special permission to operate with very strict SOPs for safety and social distancing. The industry made provisions of 'work-from-home' for their workers to complete orders and to keep their buyers intact. Slow industrial production and decline in demand have been having an impact on the cotton textile market, thereby resulting in lower prices and grower decisions for next year's cultivation.

The Government initiated several measures to help the farming community to combat COVID-19. It announced relief in three-month electricity bills for small business and SMEs, reduced 9% in interests for agri-loans for one year; price support of whitefly specific insecticides and PB Ropes and price support in certified cottonseed, and fertilisers. The government provides about US$ 400 million to support agriculture in the country. It is expected that the government could consider providing more relief in taxes and duty reductions in its budget that is formulated and announced in June for the fiscal year starting July 2020.

The ICAC Recorder

Possible Impact of COVID-19 on The Global Cotton Sector

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Bangladesh

Since the first report from China in December 2019, the coronavirus disease (COVID-19) has become a public health emergency and seized international attention. On 11 March 2020, the World Health Organization (WHO) declared the COVID-19 outbreak as a pandemic. In Bangladesh, the number of cases continues to increase since it was first announced on 7 March 2020. As of 6 June 2020 the number of positive cases exceeded 60,000 with a mortality rate of about 1.3%. To control the spread of coronavirus, Bangladesh has adopted strict pre-emptive measures by declaring a shutdown starting from 25 March that is operational as on date. Following the government decision to close all public and private offices and public transport until 25 April, the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) and Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA) announced in a joint statement issued on 10 April 2020 that ready-made garment (RMG) factories would remain closed until 25 April. More than 1,000 textile and dyeing factories reopened in major industrial hubs on April 26.

Impact on the textile sector

Apart from the health hazards the coronavirus pandemic has imposed profound stress on the Bangladesh cotton sector. The COVID-19 affected the Bangladesh garment sector in three distinct areas namely, raw materials procurement, buyer late payment and buyer cancellation of in-process orders. According to the Bangladesh Garment Manufacturers and Exporters Association (BGMEA), export orders worth US$ 3.18 billion were cancelled that ultimately affected the 2.28 million workers (Figure 1).

On 25 March 2020, Prime Minister Sheikh Hasina announced a stimulus package of Tk 5,000 crore (equivalent of US$ 5.9 billion) for export-oriented industries to mitigate the impact of the coronavirus on the country's economy. It is an interest-free loan with a 2% service charge that can only be borrowed to pay staff salaries and can be repaid within two years in easy monthly instalments. On 29 April 2020, health and hygiene guidelines have been declared by the Ministry of Health and Family Welfare to ensure the hygiene and safety of workers/staffs/employees and other related persons of the garments industry against the COVID-19 pandemic. In addition to the regular textile processing, many companies in Bangladesh are switching from their conventional products to manufacturing face masks and PPE to strengthen preventive measures for the general public and medical personnel. Moreover, arrangements have been made to provide 'free tele-medicine doctor consultations' to the garment workers.

The global apparel industry is undoubtedly in its greatest crisis. Store closures in Europe, United States and other major

Figure 1: Impact of COVID-19 on Bangladesh RMG Industry (source: BGMEA)

importing countries have been having a devastating impact on the Bangladesh garment sector. To cope with the situation, Bangladesh garment industries with the support of Government have taken every effort to overcome the crisis and to protect their employees.

Figure 2. Cotton garment sector has resumed operations

Figure 3. A garment factory in Bangladesh

Impact on cotton research and development

COVID-19 has had least impact on cotton research and development activities in Bangladesh. Although the public offices remained closed during the shutdown period, cotton research and development activities continued through the 'digital platforms infrastructure' which has been well developed in Bangladesh due to the Government policy efforts on 'digital Bangladesh'.

The Cotton Development Board (CDB), an organization of the Bangladesh Government, was established in 1972. It has mandates on cotton extension, research, seed production, marketing, and capacity building for cotton farmers. The CDB has extension activities in 32 districts and 112 upazilas of the country. Extension activities are implemented through four Regional Offices (located at Jessore, Rangpur, Dhaka and Chittagong) and 13 Zonal Offices. The Cotton Development Board (CDB) has been conducting research since 1991 at its 5 research centres located at Sreepur, Gazipur; Jagadishpur, Jashore; Sadarpur, Dinajpur; Mahigonj, Rangpur and Balaghata, Bandarban. Currently, the CDB has been implementing Bangladesh-Turkey-Islamic Development Bank Reverse Linkage (RL) project on Enhancing Capacity in Cotton Varieties Development. Within the scope of this RL project, field experiments are going on at the CDB's five cotton research centres. Cotton researchers have been working in the fields in different research centers after ensuring personal protection. At the same time, the CDB is ensuring the health and hygiene of farm workers by maintaining social distance and personal protection measures. Moreover, cotton researchers have been interactive regularly in live group discussions on research results through digital platforms. Main extension activities at the field level are designed to motivate farmers to grow cotton. Extension workers interact with the cotton farmers individually and as well as in groups. Due to the impact of COVID-19, the normal extension activities of CDB are shut down. However, the CDB has adopted digital platforms such as virtual meetings and social media for inter-communication amongst the different extension offices. Field level extension activities have been organised through group meetings with the cotton farmers by maintaining social distancing.

Figure 4. Farmers' motivation program at Mymensingh Zone

Figure 5. Cotton farmers working at Cotton Research Center, Jashore

The unprecedented COVID-19 pandemic has caused disruptions to global trade, business, and education. Bangladesh is equally affected by this contagion. The consequences of the COVID-19 outbreak on Bangladesh cotton sector are tough to handle as the entire of the global supply chain has been interrupted due to worldwide transportation shutdown. As the government in Bangladesh enforced a shutdown to suppress the spread of COVID-19, the potential negative impact on Bangladesh's cotton sector due to COVID-19 depends on the duration of the crisis.

Figure 6. A textile factory in Bangladesh.

The ICAC Recorder

Effect of the COVID-19 Pandemic on Brazilian Cotton Sector

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Abstract

Brazil has become the 4th largest cotton producer and the second largest exporter of the world in the last two years. This position was achieved due the systematic organisation of the producers and the high technological innovations introduced into production systems to circumvent several challenges. Now, producers face even greater challenges imposed by the COVID-19 pandemic. Not only producers, but the entire cotton chain is suffering from the effects of the pandemic. At the moment, cotton producers have not as yet experienced the cascading effects of the COVID-19 pandemic, at least in relation to field activities, but they have already begun to see some black clouds on the horizon. With the increase in production, Brazil needs to export about 75% of the total produce, since the domestic market consumes only, approximately, 25% of production. Brazil exports cotton to 10 countries in Asia. The five greatest importers of cotton from Brazil are China, Vietnam, Bangladesh, Pakistan and Indonesia. From August of 2019 to March of 2020 Brazil exported 1,641,946 tonnes of lint. The global recession caused by measures imposed by governments to avoid the spread of COVID-19, is expected to strongly affect the world cotton market. At the same time many domestic textile industries have reduced or stopped production. There was a 90% reduction in the demand for clothing; 38% of the industries had a drop in demand above 10% in March, compared to the same month of 2019; 88% reported cancellations or postponements of orders by customers for fear of falling sales and 66% reported having problems with the flow of production and delivery of products to customers. With the reduction in consumption from main importing countries of the Brazilian cotton there is a possibility of a drop in the exports of Brazil and increase of local stocks. The prospect of the area to be planted in the next harvest in Brazil, in 2021 will depend on the recovery of the domestic and foreign markets, mainly on the capacity to react to the economic crisis caused by COVID-19 pandemic.

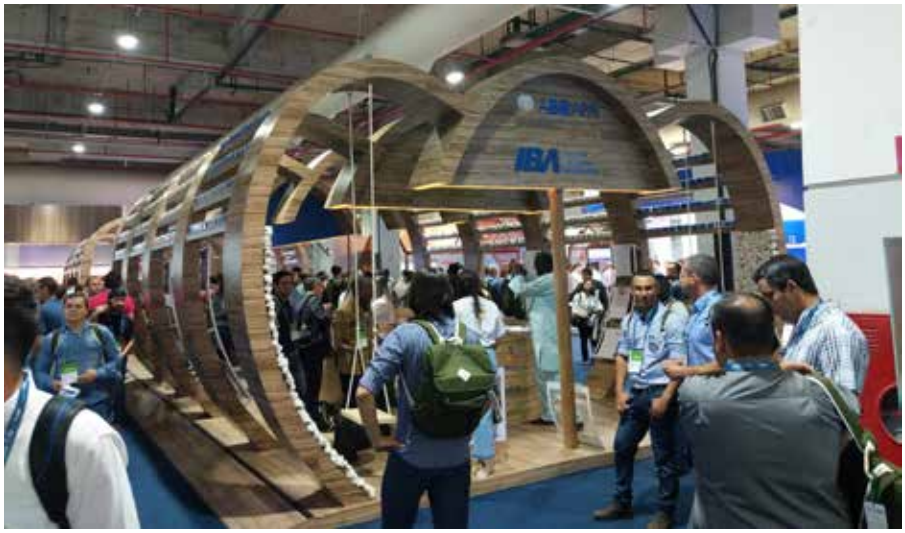


Figure 1. The cotton sector is very strongly organized in Brazil

Introduction

Brazil is the fourth largest cotton producer and the second biggest cotton exporter in the world. The National Company of Food Supply (CONAB) estimated that the cotton acreage was 1,677,000 ha in 2019-20 with prospect s of producing 2,879,000 tonnes of lint. Cotton area in the last three seasons increased by 78.6%, including the forecast for the current season, which is 3.6% higher than the 2018-2019 season at 1,618,200 ha. The forecast for lint productivity is 1,717 kg/ha or 7.9 bales/ha. This means maintaining the same yield level obtained in the last season.

Figure 2. Cotton farmers receive direct support from researchers

Brazil has been constantly improving its position in the world cotton production scenario due to the level of organisation of its producers and the advanced technological interventions deployed in cotton cultivation. This led Brazil to produce high quality cotton, with environmental sustainability, product traceability and economic competitiveness. However, Brazilian producers are now faced with an even greater challenge of maintaining the level of growth in times of the COVID-19 pandemic. Despite the scenario of great difficulties ahead, the sector continues to strive hard to be able to perform well.

Figure 3. Cotton is scientifically tested before domestic use and exports

In Mato Grosso, main producer state of the country there was an increase of 7% in the sown area in relation to the last season. According to researchers from the Centre for Advanced Studies in Applied Economics (CEPEA), University of São Paulo, with the consecutive increases in production in the last three years and record volume harvested in the 2018/19 season, foreign markets expanded, and Brazil emerged as the world's second largest cotton exporter, which led to an expansion of cotton acreages and enhanced production in 2019. This season does not seem to be different from the previous years. Brazil will continue as the fourth largest cotton producer in the world and is likely to remain second in the global export ranking, behind only the United States.

Figure 4. Cotton harvesting is highly mechanised

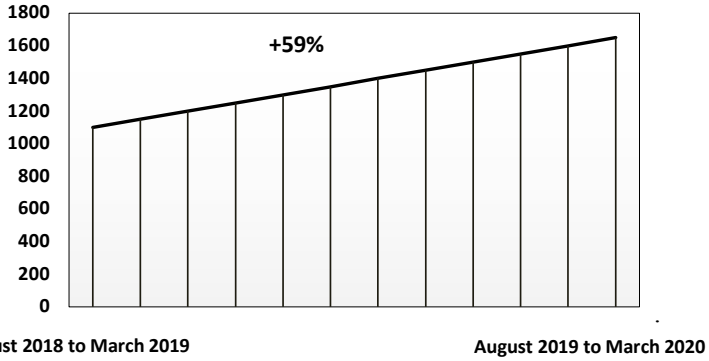
Figure 5. Cotton is properly stored and maintained before use

At this point of time, cotton farmers have not as yet felt the total effects of the COVID-19 pandemic closely, at least with reference to the field activities. On the other hand, the constant decline in international prices has become apparent due to the pandemic impact. According to the Brazilian Association of Cotton Producers (ABRAPA) the crash in market prices is the biggest worry of Brazilian farmers. The fall in international prices can have direct negative impact on the future contracts thereby significantly reducing the profitability of farmers. Another issue

to be considered is -the crash-down of oil prices, since it favours synthetic fibres; which are currently the biggest competitors for cotton -a fact of life that the cotton farmers have become used to living with.

Cotton Market in 2019 and Prospects for 2020

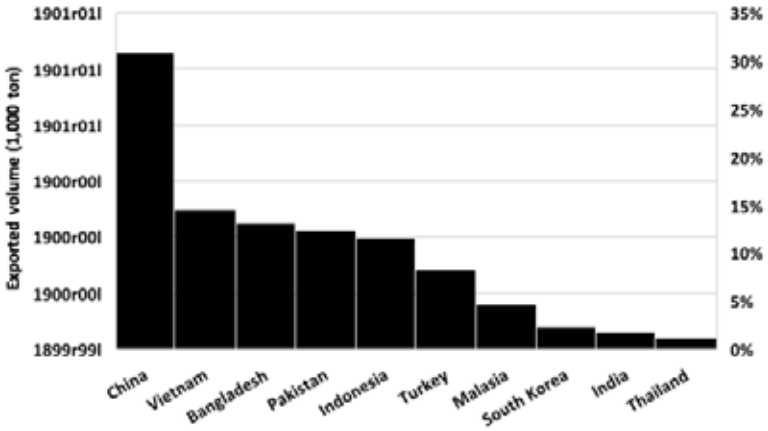
According to Executive Secretary of the Brazilian Foreign Trade Chamber of the Ministry of Economy, from August 2019 to March 2020 Brazil exported 1,641,946 tonnes of lint. The quantity exported during this period is 59% higher than the same period of the last season (Figure 6).



Sources: ComexStat – MDIC, April 2020. Adapted from ABRAPA, April 2020.

Figure 6. Accumulated export of cotton lint from August 2019 to March 2020 (1,000 tonnes)

According to the Brazilian Cotton Producers Association, Brazil exports cotton mainly to 10 countries located in the Asian Continent. The five greatest importers of cotton from Brazil are China (market share of 32% from exporter total), followed by Vietnam (15%), Bangladesh (12%), Pakistan (11%) and Indonesia (10%) (Figure 7).



Source: Adapted from: ComexStat – MDIC, April 2020

Figure 7. Main destinations of Brazilian cotton

It is important to mention that, for the second consecutive month (February and March 2020), China was not the largest monthly importer of Brazilian cotton. In the past two months, Vietnam has emerged as the biggest purchaser of cotton fibre from Brazil.

Cotton consumption in the domestic market ranged from 685,000 tonnes in 2016-17 to 730,000 tonnes in 2018-19. With the increase in production, Brazil needs to export around 75% of the total cotton produced, which allows the country to import less (Table 1)

Data presented in Table 1, show that there was no great variation in domestic consumption, which represents about 25% of the total production. At the same time, a downward trend in cotton imports is distictly noticeable, which leads us to conclude that the domestic market has given preference to the country's own cotton. In the past weeks a few industries have been importing cotton from some countries in Latin America like Paraguay and Argentina, but it seems that this is just a transitory activity associated to contracts already made or advantages obtained from new contracts. Significant changes are not expected in the domestic market due to these imports.

According to recent research conducted by the Centre for Advanced Studies in Applied Economics, University of São Paulo, currently, cotton exports are in progress and are more profitable than the domestic market. However the researchers expressed concerns that the internal surplus is still high and that it is necessary for the country to continue shipping of even more higher volumes in the coming months. This is important because of the record production expected to be harvested this season.

Season	2016	2017	2018	2019
Initial stock	349,000	201,200	245,200	691,000
Production	1,288,800	1,529,500	2,005,800	2,725,900
Domestic consumption	660,000	685,000	680,000	730,000
Imports	27,000	33,600	20,000	5,000

Source: Adapted from National Company of Food Suply (CONAB)

Table 1. Domestic consumption and imports of cotton in Brazil (tonnes)

Scenario for 2020 and 2021 in face of the COVID-19 Pandemic

Predictions indicate that Brazil could harvest a record cotton crop in 2020, if the climatic conditions continue to remain favourable. There is an expectation that 2.86 milion tonnes of cotton lint would be harvested and about 1.95 milion tonnes could be exported.

In the COVID-19 scenario, with the Brazilian government's restrictive measures that were imposed to reduce the effects of the pandemic on the population, there was a 90% reduction in the demand for clothing. Many local industries have reduced or stopped production. According to a survey carried out by the Brazilian Association of the Textile and Clothing Industry (ABIT), 38% of the associated industries experienced a drop in demand above 10% in March, compared to the same month of 2019. Among the affected companies; 88% reported cancellations or postponements of orders by customers for fear of falling sales; 66% reported having problems with the flow of production and delivery of products to customers and 41% said they faced difficulties in obtaining inputs. These changes will have an impact on the internal consumption of cotton fibre and may force an increase in the quantity of exports. One the other hand It is expected that there will be a lot of discounted offers to liquidate stocks and create demand in a downsized market.

In a recent webinar held for the fibre production chain, promoted by the Brazilian Association of Cotton Producers (ABRAPA) with support from the Brazilian Export and Investment Promotion Agency (APEX) and the National Association of Cotton Exporters (ANEA), the participants evaluated future scenarios for Brazilian cotton in the face of the coronavirus pandemic. The global recession caused by the shutdown of several sectors of the economy due to social isolation, quarantine and lockdown measures imposed by governments to reduce the transmission of COVID-19, is expected to strongly affect the world cotton market.

Before the COVID-19 pandemic, the global cotton sector was already under stress mainly because of low international prices. Although the current impact is higher on consumption rather than on production, it can affect planting intentions in the near future as a result of shrinking domestic and international markets. The crash in demand is due to the global economic recession which caused a significant reduction in cotton consumption in the importing countries. It is also important to note that the economic slowdown caused by measures designed to contain the spread of COVID-19, could affect the seed and input supply chains for the 2020-21 season, as trade and transport have been halted in many countries.

A reduction in cotton imports by China, the main importer of Brazilian cotton, has already been observed. The Brazilian Association of Cotton Producers forecasts a reduction in imports by other Asian countries as well. This will occur mainly due to the reduction in consumption by the main importers. China is expected to consume 7.1 million tonnes, which is 14% less than the previous season. Textile mill consumption is predicted to decrease by 5% in each of the three major consuming countries; India (consumption of 5.1 million tonnes); Bangladesh (1.5 million tonnes) and Vietnam (1.4 million tonnes).

There is also an estimated reduction in imports by the main importers of Brazilian cotton as indicated by the changes that occurred between March and April 2020. China is expected to import 1.86 million tons, which corresponds to 8% reduction; Bangladesh imports of 1.5 million tonnes correspond to an 8% reduction; and Vietnam's imports of 1.4 million tons, correspond to a 7% reduction.

There is still no expectation to reduce the area to be planted next season, but a possibility exists because of the concerns related to the actual changes in domestic consumption and in the level of imports. Although, cotton production remains unchanged, the textile and clothing industry has suffered significant losses. Blockages, lockdowns, unemployment and uncertainties have reduced consumption, and the recovery is expected to be very slow. The companies are unable to comply with their commitments, because of the derailed cotton value chain due to closed stores, disrupted retail markets, closed spinning mills and slowdown of textile manufacturing sector.

The performance of the cotton chain will depend on the revival of the local industry and also resuming of consumption in the main importing countries. Although there had been a significant impact of COVID-19 on the textile industries of the main importing countries of Brazilian cotton, China's recent efforts to return back to normal work have signalled hope and have had an important positive impact on textile sector. A similar reaction is expected in other Asian countries that have already gone through a crucial phase of the pandemic.

Any forecast of the area to be planted in the next harvest in Brazil will depend on the recovery of the domestic and foreign markets, mainly on the capacity to react to the economic crisis caused by COVID-19 pandemic. The foreign

markets, especialy the main importers of Brazilian cotton have the advantage of having already been through the pandemic and have started to return back to work.

Conclusions

Cotton production is yet to experience the effects of the pandemic at least in the 2020 season;

Local textile industry has suffered serious losses which may reflect in the demand for cotton;

Reduction of cotton consumption in the main importing countries may seriously impact Brazilian cotton exports;

The Economic downturn in Brazil and recession in importing countries may induce a cascading effect of demand stress in domestic and foreign markets which would affect cotton production in the next season, 2021;

It is possible that having passed through the painful pandemic in an early phase compared to other countries of the world, the Chinese têxtile industry could recover much faster than others and there is an expectation that a few other Asian countries which waded early through the pandemic may also be on the road to recovery.

Acknowledgement

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The ICAC Recorder

Argentina: COVID-19 and Cotton Situation During 2019/20 Season

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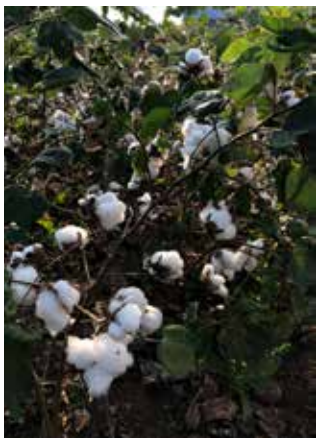

Season growing conditions, production and harvesting

According to official information, cotton acreage in Argentina was 460,000 hectares during the 2019/20 season. Compared to the last four cotton seasons, the area represents an average increase of 73,500 hectares per season nationwide.

A few main reasons for this growth are:

- good yield in previous seasons;
- decrease in profitability of competing crops; and
- implementation of effective management practices for the control of the cotton weevil. Boll weevil management played an important role in restoring farmers confidence in the crop in recent years. This was possible due to the continuous training and awareness programmes conducted for producers and technicians with emphasis on the use of pheromone traps and destruction of crop stubble at designated periods as prescribed by official organisations, such as SENASA, to prevent the spread of the insect during winter.

Cotton crop was sown either early in October or late in November. October sown crop performed well this season and the crop has been completely harvested. Average yields ranged from 2000 to 3000 kg seed-cotton per hectare. November sown crop has been harvested just recently and has performed reasonably well. Preliminary estimates indicate that the national average yields could be about 650 Kg int per hectare for a national production volume of 300,000 tons of fibre of very good quality -as a consequence of the improvement in crop yields.

Figure 1. Cotton was harvested without any hindrance

Government decisions due to COVID-19

In response to the COVID-19 pandemic Argentina declared a mandatory lockdown from 20 March 2020 to suspend all activities throughout the country. The lockdown has been extended periodically during the past two months and has now been extended recently until 28 June. Though a few restrictions have been relaxed in some regions, the government emphasised on 'mandatory and preventive social distancing' to combat the pandemic. During the lockdown period, only critical activities have been permitted to be carried out, such as those related to health, safety, and the availability of food and medicine (Figures2 and 2a).

Governments across the globe have been struggling to strike a balance between public health and economic growth. A slew of sanitary measures such as social distancing, restrictions, lockdowns and curfews have been announced to protect populations from COVID-19 which have had strong negative effects on markets and the overall economic growth. Therefore, a few countries have been considering relaxing

Figure 2. The spinning industry has been partially opened

Figure 2a. A spinning industry in operation

a few of the restrictions so as to revive the economy but without subjecting the public to health risks. Teleworking has become the new norm of official work. The national and states governments have been coordinating and regulating cotton harvesting operations and transit of agricultural produce across the country. The government set up online procedures for official authorisations related to agricultural activities. Professionals and producers have thus been able to continue farming operations efficiently without any hindrance. However, all permissions have been granted with a mandatory set of guidelines on security, protection and hygiene measures. Other summer crops, such as soybeans, sorghum, corn, etc., are covered under the same guidelines and transit protocols that have been prescribed for the harvesting period. Recovery strategies include support to producers that will be implemented in each province within a national framework, depending on the available resources.

Prices, inputs, industrial processing, trade and export

Cotton prices have dropped recently by 35-40% compared to the prices that were prevalent at the beginning of the season, which were lower than that of the preceding year. Market prices are influenced by domestic and international demand. Ginning factories, spinning mills and textile industrial processing have been severely curtailed due to the lockdown because of which the domestic demand crashed. Transport and export activities have also come to a halt in all countries which resulted in low international prices. Cotton market prices would be influenced by a revival in demand, arrivals of cotton at market yards and the progress of harvest.

Figure 3. Garment factories have been either closed or partially open

In the short term, there are no significant operational complications for fibre exports. However, with expectations of a large volume of about 200,000 tonnes to be exported, it is important that issues related to logistics should be monitored. The period of greatest uncertainty for exports will be the months of May and June, with a possible improvement of the situation from July onwards. The biggest challenge would be not to lose sales opportunities abroad

Figure 3a. A file picture of garments factory in full operation

as the markets start opening up again when it would be necessary to ship no less than 15,000 tonnes per month.

As of now clothing stores are closed. Thus, the local textile and clothing demand is almost non-existent in the local market. It is expected that the markets would start again in June-July and grow through the subsequent 3-4 months. This could lead to a local consumption of about 100,000 tonnes of fibre. However, in the absence of a steady market, the textile industry would not have the adequate infrastructure and capital to stock raw material and finished goods. Even in this difficult situation, both for the domestic market and for international export, there have been sustained efforts in adapting to the international standard classification system of cotton fibres. These international standards include the American standard that would improve the export market potential of cotton produced in Argentina and also improve the domestic market.

Argentina has suffered a substantial devaluation in recent years, which demands significant remedial actions that the producer needs to take, from access and availability of agronomical inputs which are mainly imported, as well as services which are available locally. Profitability of the cotton sector has been affected strongly by a few distorting factors such as, stringent tax pressure, withholding of fibre exports and the existence of differentiated exchange rates.

Challenges for the ensuing season

From the agronomic perspective, the main challenge for the ensuing season is to achieve a clean harvest with good fibre yields and commercial fibre quality attributes. Predictions based on historical averages indicate favourable environmental conditions in the next few months, which are expected to result in a good crop. However, it is important that a good crop is maintained by implementing integrated pest management practices for the control of boll weevil and weeds.

From the economic point of view, the biggest challenge for the Argentine cotton sector is associated with price fluctuations in the current context of market uncertainty. Different private and public sector cotton organisations of the country have proposed the following actions to overcome the current crisis and to revive the future:

1. source of financing for producers in the short term;
2. standardisation of quality parameters as per international norms;
3. assess and address export logistics;
4. solve input problems for ginning factories;
5. support all action to honour contract sanctities; and
6. declare cotton as a strategic crop in Argentina.

The ICAC Recorder

Impact of COVID-19 on Cotton and Textile Industries in Egypt

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Egyptian cotton

Introduction

It is a battle with an invisible enemy. The virus that started in China's Wuhan Province has now affected almost all parts of the world and has created one of the worst periods in human history. Almost all major economies, including the United States, China, India and Europe, have been disrupted and many countries are under complete or partial lockdown. The pandemic has shaken up both the human race and the economies of the world. The impact of the COVID-19 pandemic is rippling through the major cotton economies. Textile manufacturing and trade has been the worst hit, while demand for food commodities hasn't been hit as badly as the demand for textiles and clothing. It is possible that in the next few months the negative effects of COVID-19 on the textile sector will permeate through the globe, in the form of unemployment and economic slowdown.

The coronavirus disease COVID-19 is caused by a severe acute respiratory syndrome coronavirus abbreviated as SARS-CoV-2. The impact of COVID-19 on human lives and the business economy is staggering. Scientists around the world are working tirelessly to understand this RNA virus and how they can control it. In the absence of a cure or vaccine, the best way to keep COVID-19 under check is to contain the spread of the virus. The RNA based detection technology RT-PCR "reverse transcription polymerase chain reaction" in combination with 'Real-Time PCR' is being widely used to detect, quantify and precisely trace the location of COVID-19 infected persons and subsequently aid in restricting its spread. The more people that are tested for COVID-19, the better it is for controlling the spread of the virus. In addition to advanced RNA based technology, the antibody-based enzyme-linked immunosorbent assay (ELISA) is also widely used in the agricultural sciences to detect plant viruses. Though this technology is still useful, it is rapidly being replaced by DNA/RNA technologies that are more sensitive and specific.

Virus epidemics in agriculture

Agriculture has also encountered similar kinds of new and emerging viral diseases. The methods to detect them are not all that dissimilar from the ones used to detect human viruses. Though plant viruses do not have such a direct impact on humans as COVID-19, they can be very devastating to a grower's crop. Sometimes the entire crop is lost. Like COVID-19, if unchecked, plant viruses can also become pandemic and cause severe damage to the agribusiness around the world. Currently, cotton fields in different parts of the globe encounter emerging viral disease called Cotton geminiviruses. The geminiviruses cause cotton leaf crumple disease (CLCrD) and cotton leaf curl disease (CLCuD). Leaf crumple is found in the Southwestern USA, Central and South America, while leaf curl has been described in Africa and Asia. These viruses are quite different when the DNA sequences are compared and produce different symptoms in the field. Leaves on cotton plants infected with CLCuD, curl upward, have swollen veins, and enations growing out from the leaf nectaries. Leaves on CLCrD infected plants, in contrast, curl downward giving the crumpled effect. In addition, enations may be present on flowers of leaf crumple infected plants. While both viruses can cause severe losses when infections occur on young plants, lint produced on leaf crumple infected plants, even though reduced in quantity, is not affected in important quality parameters. Leaf curl infected plants produce no useful lint. There are many plant species that harbour the geminiviruses but are asymptomatic. As seen

in the news every day, COVID-19 infected humans can also be asymptomatic. Another similarity between the plant virus diseases and COVID-19 is that there is no reliable cure for either of them.

The impact of COVID-19 on cotton growers, traders and textile industries

World cotton growers and traders were just clawing back from a tough year in which the U.S.-China trade war sent prices plummeting. Now the coronavirus pandemic has set the clock back again to a tough phase. Over the past few months major global economies such as China, Europe and United States have been experiencing immense pain and suffering. The impending economic slowdown invariably leads to a decline in the demand of discretionary products such as textiles and clothing. Thus, from an economic point of view, the future of the textile industry is a major concern for the millions across the world whose livelihood depends on the industry. The demand for textile products abroad and domestic sales have come down to a grinding halt due to the panic situation created by the COVID-19 outbreak. Due to the lockdown, the cotton value-chain industries, the textile-related factories and shipment of raw materials are closed and it is tough to hazard a guess as to when these will be allowed to open. Livelihoods have been destroyed and workers are traumatised amid the confusion. The business community is scared because of cash crunch, supply chain disturbance and manpower-related issues.

Figure 1. Fibre quality testing

Cotton futures on the Intercontinental Exchange were trading at their lowest levels since 2010. In last March 2020, with the most-active futures contract trading down 2.3%, to just below 54 cents a pound. Since the start of the year, they have shrunk by 23%.

Cotton growers and traders were hoping that prices would post a sustained recovery after a cease-fire in the two-year trade war that roiled markets world-wide.

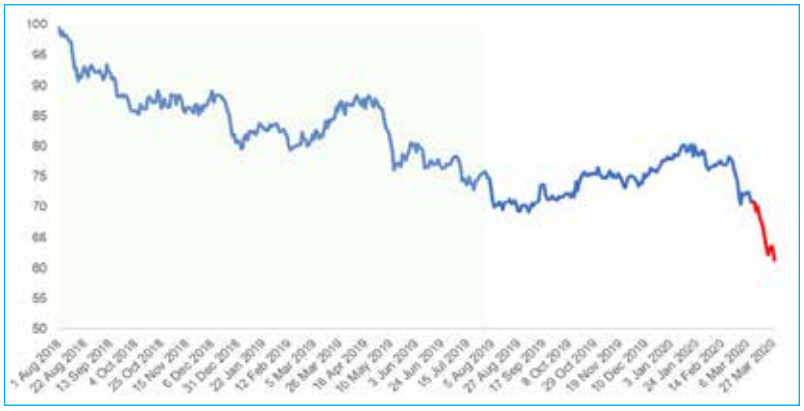

Figure 2. Impact of Trade disputes, economic slowdown and COVID-19 on Cotlook-A Index:

Cotton trade has been badly affected by coronavirus internationally. Local textile mills and ginners are still in distress. Textile mills in many parts of the world are shut down after the building up of inventories as a result of suspension of export orders from abroad.

Figure 3. Stocks have been piling up across the world

To make matters worse, major international importers, especially the big American and European importers of textile had hinted of cancelling the orders and stopping of shipments due to which textile mills were in distress. Though some mills had started working, partially though, there is a lack of clarity on whether the textile products would regain demand. Due to the closure of mills, unemployment has been increasing. Textile mills were facing double losses due to the extraordinary delays in shipments and cancelling of orders. Thus, coronavirus is forcing clothing retailers to shut stores world-wide. There has been no business in the local cotton markets due to coronavirus. However, Cotton market associations worldwide haven't suspended their operations in the international markets and spot rates have been issued regularly.

The global stocks are expected to increase to an all-time high of 21.6 million tonnes, with record stocks in the US, India, Pakistan and Turkey. However, the main problem is with the textile demand that has shrunk to a low. In Egypt, the area of cotton production is expected to fall by 30% in 2020 to 120,000 hectares. In China, business has revived back to near normalcy, but there is uncertainty in the global cotton market. In India, too, the coronavirus is hampering business operations, but the minimum support price has been effectively shielding farmers from the declining

Figure 3. Egyptian cotton in bloom

market prices. Manufacturers worldwide are trying hard to keep factories operational as the coronavirus pandemic threatens one of the biggest disruptions in memory to supply chains, staffing and demand.

Factories are staggering shifts, banning visitors and installing barriers between workers to protect them from infection. Some executives worry that these measures reduce the staff strength and thus might not be enough to maintain production, especially since more and more people are forced to stay at home to take care of their children because schools and day-care centres are shut down.

According to a recent survey conducted by the International Textile Manufacturers Federation (ITMF) of 600 companies, by the mid of June 2020 the current orders of textiles have dropped 42 percent on average globally, and the expected global turnover in 2020 declined by 32 percent compared to 2019.

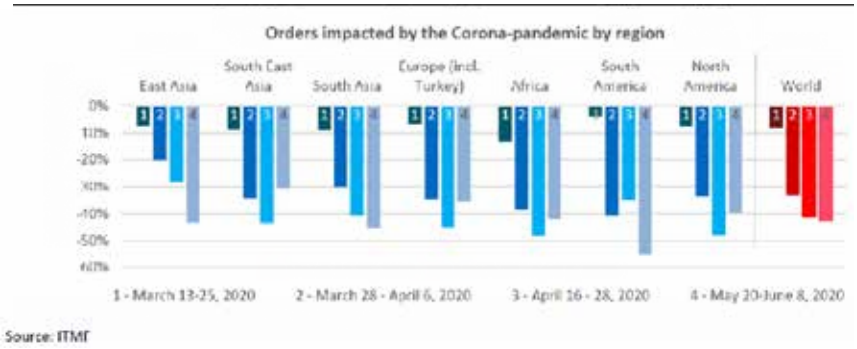

Figure 4. COVID-19 pandemic's impact on orders

The near future

COVID-19 has changed everything. The world tomorrow will not be the same as it was before COVID-19. The globe went into a kind of stupor. The lockdowns have hit the earnings of the working class whereas the white-collared workers have been able to work from home and continue with their incomes. The vast majority of the global population has not only lost its income and livelihood, but also lost its purchasing power, which invariably results in a global economic slowdown. Thus, the current global economic system is bound to crumble in the short term, while it is also possible that new economic systems could evolve as societies might discover ingenuous ways in the process of recovery from the pandemic shock.

Populations under stress are likely to accept any form of government support, control and regulations if they are convinced that these measures would will help them overcome the crisis. Government support measures include guaranteed income schemes and business loans. As the pandemic continues its tirade on global health, it will not be surprising to expect new obstacles in transfer of movement from one country to another, which would only aggravate the economic crisis.

Cotton textiles mean livelihood and employment. The COVID-19 pandemic has hit the cotton sector probably more than it hit any other. Global pandemics are not new to the world; neither are economic slowdowns. However, the whenever the world encountered difficult times, it is the underprivileged and weaker sections of the society that are always the worst affected. The world continues to combat challenges and has always been able to tide over recurrent crises. The world is still under the grip of the pandemic. A few countries have started their journey of recovery. In the journey of revival, the world would be a better place if the recovery brings back employment and livelihood back to the poorer sections of the society that are below the poverty line, especially in the least developed countries of the world.

The ICAC Recorder

COVID-19 and Cotton in Sudan

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In Sudan, cotton has been harvested but all ginning factories and spinning mills are closed; consequently, seed cotton prices have been negatively affected. Companies failed to export their cotton which has had a direct bearing on costs in stores. Cotton exported by trading companies is stuck in the target countries, but payments have not as yet been made. These companies also operate as contracting companies which finance farmers for crop production operations. Trade and export disruptions have a direct impact on the financial security of companies and availability of cash for cotton farming.

Land preparations start in November and continue through May; most of these practices have been affected by the spread of the disease. Cotton sowing for the coming season is expected to be affected by delays in seed availability, input supply, preparatory arrangements and input-distribution.

Sudan imports all cotton input chemicals, such as fertilisers, seed dressers and herbicides; the prices of these chemicals wherever available have jumped 3-4 times. The limited availability of these chemicals shall seriously impact cotton production, especially due to poor weed management on account of weak herbicide supplies.

Given the fact that COVID-19 shall affect the whole world, Sudanese farmers will be focusing on food crops; sorghum, millet and maize to secure their home food and for exports.

As of now, the COVID-19 damage is continuing across the globe; the situation of cotton markets is uncertain, and farmers are hesitant to plant cotton. However, it is clear that raw cotton prices have crashed, textile processing has come to a standstill, clothing stores are closed, and fabric demand has crashed. In light of these developments, it is clear that farmers will be very reluctant to prefer cotton farming over food crops. Therefore, a huge cut in cotton areas can be anticipated in the forthcoming season.

The ICAC Recorder

Possible Impact of COVID-19 on the Global Cotton Sector: The Kenyan Perspective

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Introduction

Before the pandemic, Kenya was consolidating its new plans and strategies that would contribute to sustainable socio-economic development of communities growing cotton in line with the Country Big 4 Agenda[1]. The Country imports an estimated 70% of its lint requirement from Tanzania, Uganda and Mozambique. In its new strategy, the country seeks to improve its capacity to supply enough high-quality cotton to its textile manufacturing sector. For efficient implementation of the strategy, the government established 8 operational field offices covering all the 22 cotton-production counties[2]. These offices work closely with the County governments' extension service department and the private sector (ginning factories, input suppliers and spinning/ textile firms) spread across these areas. The strategy entails provision of technical and advisory services, improving quality inputs access, marketing and creating an enabling environment for active private sector participation.

Impacts

Normally farmers receive free cotton planting materials (fuzzy seeds) from the government delivered near the growers' fields. The seed is usually accessed from designated private and government stores. In its strategy to improve cotton productivity, early this year (2020) new superior commercial seeds were released by the Kenya Plant Health Inspectorate Service (KEPHIS). Just before the COVID-19 outbreak, promotion campaigns were ongoing to sensitise growers on how to access the new seeds through direct purchases from the seed suppliers based in the capital city (Nairobi). On average, conventional seeds including their transportation would cost the government 64US cents/Kg. The seed rate is 6-7kg/acre. The cost of the new seed is 20USD/Kg (30 times higher). The seed rate is 1.6Kg/ acre (low density crop) and 4.5-5.0 Kg/acre (narrow spaced crop). The productivity of the new seed is 3 times higher than the conventional seeds. The western and coastal regions of the country plant their cotton crop in March/ April season.

Figure 1. Quality assurance of cotton

COVID-19 has necessitated the restriction on movement and social distancing to contain the pandemic, because of which there will be disruption in acquisition of daily labour in some regions. This will affect the cost and access to hired farm labour. There are acute delays in acquisition of imported seed supplies and pesticides. The government has witnessed the cancellation of production contracts between ginning factories, seed suppliers and growers emanating from the late delivery of planting seeds in the March/ April season. The superior planting seeds arrived into the country late after the closure of the planting window practiced in the irrigation schemes where the seeds were to be planted. Growers accrued loss from land lease and tractor hire costs for ploughing while the seed suppliers have dead stock from the seeds. With restriction on the movement of carriers of goods and persons, transportation costs for inputs between some parts of the country may increase. Apart from cost increases for the transport of inputs, there will be

inefficiencies arising from interrupted operations that will have an impact on outputs. The national area under production may reduce by 10% in the short term and may decline further in the coming seasons of October/November 2020 and in March/April 2021. Future area under production would depend on growers' perception of the impacts of the pandemic on seed cotton markets and the implemented mitigation measures. Growers are monitoring the price of seed cotton because of an anticipated global price drop of lint arising from the reduction in the demand for textile products. Being a net importer of lint, the country's stakeholders continue to peg seed cotton price on the global lint price and therefore the cotton price to the grower will likely be impacted. Without early interventions, cotton grower families are likely to become more vulnerable to risks of food insecurity from poor yields, post-harvest loses, interrupted markets and depressed prices. Growers and their families may not be able to meet their food requirement and decent nutrition for good health.

Figure 2. Mills are closed

On the production front, the immediate outlook is that where cotton farming will continue, the deployed practices may be less than optimal which could affect yields and quality of produce. As such existing economic security in the rural cotton farming communities that would normally support other needs in the families such as health and education could be disrupted. Businesses will be threatened and the resilience of rural Agro-dealers and other peripheral operators (seed cotton aggregators, stores operators and ginneries) will be lost, thereby impacting liquidity flows in the rural areas, thus further aggravating the challenges in the sector.

Possible remedial policy measures

For African countries such as Kenya where cotton is grown in Arid and Semi-Arid Lands (ASALs) for food security, it is important to recognise that COVID-19 pandemic crisis can quickly transform into a food crisis in these areas. There is an urgent need to mitigate any possibilities of serious disruption of the rural economies where livelihoods are predominantly reliant on cotton to meet their basic needs of food, health, employment and education. Governments need to put in place measures to ensure that cotton production, its marketing and trade continues to function. Central to the interventions will be to ensure that farmers remain interested in growing the crop and are assured of timely access to inputs, information and markets. Tools must be provided to growers and the supporting rural infrastructure systems to help them adapt to the impending changes to ensure quicker recovery. Governments and private sector actors need to be encouraged to leverage on digital tools to ensure services such as agriculture extension and inputs supply channelled through e-voucher systems to deliver them to the beneficiaries efficiently. Continued service delivery through such innovative systems will strengthen trust between growers and their respective public and private sector support agencies. Finally, governments may deliberately set aside funds in the form of a rural poor stimulus facility to cushion growers from risks. The facility can be supplemented through appeals to development partners and international agencies to:

- provide inputs for the production of cotton by poor smallholder producers so that they can combat the immediate effects of the pandemic
- facilitate access to markets to support smallholder farmers to sell their cotton in conditions where restricted movement is interrupting the functioning of markets, including providing logistics and storage support.
- provide targeted funds for the cotton related Small and Medium Enterprises (SMEs)s in the rural areas to ensure that sufficient liquidity is available and to ease immediate loan repayment requirements to maintain services to growers and sustain jobs offered by this segment to the community.
- Leverage on the use of digital services to share key information on production, weather, and markets under the limited movement

The immediate policy measures may encompass analysing needs and availing stimulus support to cushion the vulnerable groups. This consideration must go beyond the crop production to include processing and marketing. The interventions must target outcomes that would catalyse quick recovery at the shortest time to protect loss of investments, employment and reduce suffering of rural communities. The long-term national strategy measures need to consider creation of sustainable demand, price stabilisation of cotton and lowering operational costs. With restriction on movement and poor access to outside markets, deliberate market-oriented policy actions like

Figure 3. Fibre testing in Kenya

enforcing preference and reservation rules to support local manufacturing industries through 100% regulated local sourcing of public sector requirements from these factories will guarantee sustained demand for lint immediately. In return, the factories will cushion the producers and Small and Medium Enterprises (SMEs) to continue producing and operating. Other support measures to the manufacturing sub-sector can be targeted revision of power tariffs and tax waivers to reduce their operational costs.

Conclusion

Considered policy measures to support the cotton value chain enterprises in dealing with the impacts of the Corona virus pandemic will have to be dynamic in nature. For quicker recovery, it would be imperative for governments and policy makers to continuously encourage and rely on social dialogue with affected groups in the chain for solutions. Although governments will play a focal role in giving the required interventions to lay grounds for recovery and pave the way out of the crisis, all the necessary actions cannot be left to the governments. Support will be required from financial institutions, non-government organisations, sector associations and relevant agencies in mitigating the pandemic effects on growers, businesses, economies and industries.

References

Big 4 Agenda[1] – This is an economic blueprint that was developed by the government to foster economic development and provide a solution to the various socio-economic problems

Counties[2] –These are geographical units established by the 2010 Constitution of Kenya as the units of devolved government. They perform essential administrative and devolved functions of the national government including welfare services for the public.

The ICAC Recorder

Possible Impacts of the COVID-19 Pandemic on the South African Cotton Sector

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Hennie experienced the highs and lows of the South African industry over the past 42 years and his experience came in handy with guidance to get the cotton industry back on track under the new Cotton Cluster dispensation where production growth of over 600% were recorded since 2014.

Preface

The COVID-19 pandemic and consequent lockdown is still in full swing and severely impacting both the economy and the entire population. COVID-19 has caused widespread turmoil and volatility since the start of 2020 and the measures implemented to contain it have sent shockwaves throughout the global economy. Consecutive downgrades to the sovereign credit rating of South Africa to sub-investment level has led to a weakening of 40% to the local currency against the US dollar since the beginning of 2020, whilst economic activity is slowing down and early indications are that the economy can contract by as much as 6% in the year under review. The South African economy is already in a recession technically, with annualised growth of -1,4% in the fourth quarter of 2019 following on -0,8% growth in the third quarter.

Possible effect on the agricultural sector with specific reference to cotton

Although South Africa is a net exporter of agricultural products, including the cotton sector, it imports a substantial share of the inputs required to produce this surplus which implies that local prices are subjected to the same supply and demand forces that drive international markets. Farm gate prices of domestic inputs would therefore be strongly affected by international price fluctuations, currency exchanges, shipping and distribution costs. Another worrying factor is that most of South Africa's critical inputs are sourced from countries/regions that are severely affected by the pandemic.

The risks associated with the high dependence on imports for critical inputs, are twofold. Firstly, it relates to the availability of inputs, either due to supply disruptions in major sourcing countries or logistical and distributional challenges arising from COVID-19 containment measures. Domestic uncertainty regarding the supply and distribution of agricultural inputs may further aggravate the challenges regarding the timely availability of inputs. While most agricultural value chains have been exempted from the lockdown restrictions, many of the support services required for the agricultural value chains to function efficiently are not operating at full capacity.

Secondly, the risks related to the affordability of imported inputs, which are not only linked to their availability but also influenced by the macroeconomic environment where the relative weakness of the exchange rate for instance, has the potential to cause substantial price volatility. From an affordability perspective, the two biggest factors influencing costs of inputs are the Rand/ US Dollar exchange rate and the price of crude oil.

From a cotton point of view, the timely procurement of inputs and commencement of such required processes are critical to optimise both the quantity harvested and quality of the product. South Africa's cotton crop is at the end of the growing season and harvesting has already started. This will require enough labour availability for harvesting, transport and storage related activities as well as machinery and parts for repairs. For winter crops, which include wheat, barley and canola, the planting period will commence soon. Producers need to start with land preparation and planting, which requires an adequate number of farm workers to operate machinery and initiating these activities will be dependent on the timely availability of inputs such as seed,

chemicals, fuel, fertiliser, machinery/implement parts, repair services and/or technology support.

Moreover, another big challenge currently is the marketing of the remaining 2019 cotton stocks. The biggest threat for affected farmers will be liquidity and cash flow for follow-up crops, or when making planting decisions as the finance model for cotton is based on the sales of the lint as collateral. Without selling the lint the ginner/trader cannot pay the farmer upfront when the raw cotton is delivered. The biggest threat is the timely sales of these supplies against the backdrop of the looming worldwide recession and resulting lower demand from textile manufacturers. This will have an impact on the current and future price paid to farmers. The biggest challenge will come when farmers need to make planting decisions towards the end of 2020. The relative lower prices due to the macroeconomic demand and supply factors will have a great impact on the cash flow position of farmers going forward.

The biggest impact will be felt in the recovery phase during which new crops will be established due to price pressure of critical inputs as explained above. Cotton farmers might opt for alternative summer crops e.g. maize which is cotton's main competitor and also the staple food of the country while from a food security perspective, there might be a higher demand for maize and resultant higher relative prices which in turn could lead to a reduction in cotton hectares.

Possible effect on textile, clothing and retail industries

Before the pandemic arrived, the South African economy was already in a tough position, e.g. load-shedding's effect on production and productivity and a low growth rate. The result of the pandemic would be a lower growth rate as mentioned above and a decline in production. It is foreseen that a few textile companies who is already on the edge, would close. Unemployment will increase, with the resultant fall in consumer spending. This will put retailers under pressure and will result in the closure of some retailers. There are already companies, both in manufacturing and retail, that indicated that they might not open their doors after the phased re-opening of the economy.

Imports of textiles and clothing from China accounts for about 60% of imports. Retailers could be hurt by the slower imports from China and other countries. During the first two months of 2020 (compared to the same period in 2019) imports of cotton and other textile articles decreased by 16%, while exports decreased by 11%. The volume of production index for textiles and clothing declined by 28% during the first 2 months in 2020 compared to the same period in 2019 (*although part of it could be as a result of a generally slower period of the year*).

Government actions

The first phase began in mid-March when government declared the coronavirus pandemic as a national disaster. This included a broad range of measures to mitigate the worst effects of the pandemic on businesses, on communities and on individuals. The measures included tax relief, release of disaster relief funds, emergency procurement, wage support and funding to small businesses.

As a second phase, the government announced a massive social relief and economic support package of R 500 billion (US$ 27 billion) which amounts to around 10% of our GDP to stabilise our economy, address the extreme decline in supply and demand and protect jobs.

The third phase is the economic strategy that the government will implement to drive the recovery of our economy as the country emerges from this pandemic. Central to the economic recovery strategy will be the measures that government will embark upon to stimulate demand and supply through interventions such as a substantial infrastructure build programme, the speedy implementation of economic reforms, the transformation of the economy and embarking on all other steps that will ignite inclusive economic growth.

Conclusion

It is likely that the worldwide situation will not return to normal until a vaccine is available to prevent seasonal outbreaks in the future. Things will not be "normal" overnight. Borders and trade will not be opened with immediate effect and the world economy would need to continue to grow for a long and indefinite period before the local economy will register any growth rate.

Although there is uncertainty as to what the country, economy and business will look like after the lockdown has been lifted, it is certain that we will emerge into a very different world, one for which we need to start preparing for today. Employers will not be able to return to 'business as usual' at the flip of a switch but will have to take some difficult decisions to reinvent their businesses going forward. This may entail the implementation of several different business strategies to address, for example, conditions of employment and redundancy.

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The Impact of COVID-19 on Cotton Production in Mozambique

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Abstract

This paper shares the impact of COVID-19 on cotton production in Mozambique, basically in the central and northern part of the country where cotton is grown. Cotton in Mozambique is an important cash crop for over two hundred thousand rural households. Due to COVID-19 pandemic, a state of emergency was declared by the President of the Republic of Mozambique, on 1st April 2020, for two months and consequently all citizens (including in the rural areas) were not supposed to have meetings in large groups and travel across the country. The state of emergency also included several other restrictions to contain the pandemic. Analysis has revealed that at the farm level, the minimum price for the current season has decreased by 18%, which may lead farmers to abandon the crop without picking and also cause a reduction in the number of farmers growing cotton in the next season. Nevertheless, the government is looking to subsidize the minimum price to support farmers. At the factory level, COVID-19 does not appear to have caused any effect on the unemployment situation. Very often, ginners complain about lack of market for their fibre of the preceding season (stocks) which may compromise the liquidity for marketing of the seed cotton of the current season (2019/20).

Introduction

Cotton is an important source of income and livelihood in Mozambique for around 200,000 smallholder famers. Currently it accounts for over 8% of agricultural exports and ranks as the country's fourth major export commodity ahead of tobacco, vegetables and legumes, and fruits. Though farmers engage in the production of other commodities, especially food crops, their main source of income is usually cotton. This cash crop represents 52 to 83 percent of household's income and 20% of household's total sale. Along the value chain, it creates about 20,000 job opportunities for permanent and temporary workers. It's contribution to the balance of payment is around $35 million annually.

Cotton production is mainly carried out in the central and northern regions of the country, where edaphic and climatic conditions are suitable compared for the crop to the southern region. Across the country, Nampula and Cabo Delgado Provinces in the northern region contribute to about 70 percent of the total cotton output. Approximately 75 to 80 percent of the crop is planted between 11th December to 10th January and harvested from the end of April to June. Technical assistance is provided by the public and private extension services. The average land-holding size is 0.8 hectares, and the average yield per hectare has been about 500 kg seed-cotton per hectare (400 to 600 kg/ha), which is very low in comparison to the yield per hectare achieved by smallholders elsewhere in other African countries (around 1500 kg/ha).

The growing season 2019-20

For the growing season 2019-20, about 190,000 farmers planted cotton in 140,000 hectares with most of the area in the central and Northern regions of the country. However, a few fields were affected due to erratic rainfall and floods mainly in the central region and also due to poor quality seeds. It is estimated that farmers may have only managed to sow 135,000 hectares and could expect a production of 56,000 tonnes of seed cotton. This amount of seed cotton may yield 22,400 tonnes of fibre that would mainly be exported to Asian

Figure 1. Garments: made in Mozambique

countries such as Bangladesh, Vietnam and Indonesia. About 2 to 5% of the cotton produced in Mozambique is consumed domestically.

Response to COVID-19

The COVID-19 pandemic hit Mozambique as it spread across the world. The crisis caused by this pandemic around the world is overwhelming; the primary sector most affected is tourism; consequently, lots of jobs and livelihoods were lost. As on 16 June 2020, the country recorded 609 positive cases with 3 deaths. A state of emergency was declared by the President of the Republic of Mozambique, on 1st April for two months (April – May), when there was only 9 cases, activating a stage 3, meaning the closure of the borders and other measures that limit people from moving across the country, practicing a social distance of 1.5 meters between people, mandatory usage of face masks, washing hands regularly and avoid meetings of more than 10 persons.

Consequently, the sector has noticed suspension of training sessions in large groups, avoidance of individual contacts, observing social distance and delay on inputs delivery -mainly pesticides that were necessary for boll protection. Regulators have prepared specific precautionary measures to be undertaken during the purchase of seed cotton which takes 4 months from June to September. This activity involves physical interaction of persons in the market at purchase points that may evolve as hotspots of contamination.

Despite the fact that the number of positive cases is very less in Mozambique, the ripples that the pandemic has caused across cotton trade in the world has affected the cotton sector in the country. The impact of COVID-19 on the cotton sector may be divided in three sections, at farm, factory and export levels. At the farm level, the minimum price has decreased from 23.3 Mts/kg ($0.34/kg) to 19 Mts/kg ($0.28/kg); as a direct consequence of which, some farmers have abandoned cotton fields without picking. This situation is likely to have a strong negative impact in the next season, leading to a decrease in the number of cotton farmers and a consequent decline in area and production. The government, through the Ministry of Agriculture and Rural Development, is exploring the possibility of extending subsidies through minimum support price to prevent negative impacts on cotton farming and also thereby supporting farmer incomes and livelihoods.

At the factory level, the ginning sector did not report any cases of rising unemployment due to the pandemic. Very often, ginners complain on lack of proper liquidation of stocks. Unfortunately, the stocks from of the previous season and the production of the current season together can pose a big challenge to exporters in view of the fact cotton consumption in international mills has declined and trade operations haven't resumed as yet. The biggest fear of the ginners is the impediments in cash-flow that would be required to procure seed-cotton of the current season's harvest; because the stocks of the last season are lying without market and consequently the lack of liquidity blocks cash-flow.

Though cotton consuming countries have partially resumed activities, cotton imports and exports are far from reaching normalcy. In the absence of exports, local stocks will increase, especially in countries that do process fibres and rely on exports of raw fibre to liquidate stocks. Increasing stockpiles can be immensely challenging for ginners and traders who will incur expenses on extended warehousing over uncertain periods of time, at the risk of incurring losses due to deteriorating quality in long-term storage. Thus, the current situation will have short-term and long-term impacts on production, processing, trade and exports. The COVID-19 pandemic calls for a concerted joint action by all countries to be able to circumvent the challenges so as to minimize negative impacts on heath, economy and livelihoods.

The ICAC Recorder

Potential Effects of COVID-19 on the Cotton Sector: A General Perspective

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Figure 1. Cloth Face Masks to prevent COVID-19 infection

Introduction

The story of the severe acute respiratory syndrome coronavirus (SARS-CoV-2) and the novel coronavirus disease 2019 (nCOVID-19) that it causes, is one that resembled a developing whirlwind. COVID-19 gathered momentum and lethal power across the globe with each new day. More than 8.5 million were infected and over 457 thousand people were killed during the six-month period from January to 20 June 2020. A pandemic of this magnitude is unprecedented. Extraordinary containment measures were instituted by governments across the globe; these measures have affected every pillar of human existence including religion, commerce, science, tourism, and agriculture. In agriculture, the cotton industry would not be an exception. Cotton is a world-wide commercial crop that is highly traded and is vulnerable to world socio-economic instability. In recent years competing cash crops, alternative synthetic fibres, high production costs, and climate issues contributed to increased vulnerability of cotton. COVID-19 caused global socio-economic instability and would shake the cotton sector considerably. A reflection on the potential effect of the COVID-19 pandemic on the cotton sector is compelling.

The Scope for Coronavirus Containment

The unobtrusiveness, aggressiveness, and lethality of COVID-19 have led nations to respond with decisive painstaking mitigation measures. The list of measures that were taken to target coronavirus spread can be quite long; thorough washing/sanitizing of hands with anti-germs and or soap, face-masking, enforcing lockdown to confine people in homes and countries, closure of schools, colleges and universities, social distancing, prohibiting large gathering, shutting-down of "non-essential" services, and, national and international travel restrictions are a few cases in point.

Potential Effect on Cotton Production

When coronavirus was first record in Southern Africa, for instance, cotton crops had already reached the reproductive stage. At that stage of cotton, effective pest control is critical otherwise loss of fruiting structures will certainly cause reduction in yield and income. The physical interaction between the crop and the farmer normally is at its highest at the peak boll formation stage. Crop-pest dynamics needed to be monitored closely. The crop required "baby care". Farmer pre-occupation with need to survive the pandemic had the potential to cause lapses in crop management at the critical growth stage that could have resulted in compromised crop performance.

Disruption of National and Global Supply Chains of Agricultural Inputs

International restriction on air, sea and road transport had the potential to hinder the global agrochemicals market. Equally affected could be packaging materials supply chain at a time when cotton sectors in the Southern Africa region get ready for marketing. Packaging materials are largely imported into the region. Countries that are net importers of the inputs would be severely handicapped. Even in countries where agricultural inputs are manufactured, lockdown could have caused manufacturers to shut down without prior warning to retailers to enable restocking.

COVID-19 Pandemic Presents Complications in Preparing for 2020/21 season

Activities such as cotton planting, seed-cotton harvesting, processing, packaging and supply, and manufacture and trade of inputs such as fertilizers, pesticides, and procurement of such inputs by the farmers could be complicated by imbalance in demand and supply. Input shortages affect future cotton and other crop production dynamics and productivity.

Effect on Fabric Consumption

Demand for face masks notably increased consumption of cotton fabric. Cloth face masks (Figure 1) were reported to be particularly appropriate in circumstances where the risks of community-based transmission were high. Under conditions of restricted international trade, the local cotton fabric manufacturers are set to benefit against cheap imports that would be preferred under normal circumstances. Countries with large textiles industries that survived on exporting would experience decreases in fabric prices.

Potential Rise in Costs toward Human Safety Needs

COVID-19 is not only scary, but deadly. Human resources need to be managed with extreme care in order to prevent infection. Additional care and costs need to be borne by the farmer for sanitizers, face masks, goggles and gloves. The potential risk of infection at all the stages of production and processing needs to be minimised at a cost which will have to be borne by farmers and stake-holders..

Potential Increase in Availability of Labour

Cotton is a labour-intensive crop. Much of the COVID-19 trouble period coincided with the cotton-picking stage in the southern hemisphere and sowing operations in the northern hemisphere. Informal traders whose activities were ceased due to COVID-19 containment measures would have to turn to part time farm jobs as a means of livelihood. Closure of learning institutions released potential family labour; that has the effect of reducing hired labour costs.

It Is said that the Environment is The Winner from the COVID-19 Crisis

Environment is the natural capital that needs to be cared for. COVID-19 containment measures that indirectly limit chemical supply and use could enhance nature's self-healing, balancing and restoration processes. The farmers' health can be enhanced. Cost of production can be "inadvertently" reduced. Is a De-chemicalized Integrated Pest Management (DIPM) system, something that is inconceivable in ordinary times, happening now? Such a system could promote build-up of naturally occurring biological control of pests through proliferation of parasitoids and predators.

Figure 2. A ladybird beetle preying on mealybugs

Conclusion

The spread and killing nature of COVID-19 continues unabated. The coronavirus is invading nations leaving social and economic scars that will last for very long. The full economic and social impact of the pandemic on the cotton industry is currently immeasurable and its end remains uncertain. The outlook is helplessly deteriorating. Governments may consider incentivising the cotton industry because production, processing, marketing and consumption patterns in the future are difficult to predict, if not impossible to determine. The detrimental effects of the COVID-19 pandemic on the cotton industry may not be quantifiable now because the rampage appears far from over. It is difficult to reliably forecast the global COVID-19 trends. Although dealing with coronavirus means dealing with life and death, efforts should be made towards minimizing disruption on cotton production and trade at local, regional, and international levels. Clearly, the world will not be the same hereafter; mankind will have to gear up towards caring and sharing, safeguarding lives and livelihoods; and in the process of recovery, ensure that the environment is protected well so that the possibilities of any future pandemics are minimised.

The Role of Cotton in Face Masks

ICAC

EXECUTIVE SUMMARY

The coronavirus disease COVID-19 pandemic warrants community protection through personal protective equipment (PPE) that commonly includes a face mask to prevent spread of infection. By early May 2020, wearing face masks for the general public was made mandatory in at least 75 countries that comprise about 88.0% of the global population.

In developing and least-developed countries, face masks are either in short supply, inaccessible or unaffordable for the poor who constitute the majority. Fabrics made of cotton, polyester and their blends are easily available to prepare home-made non-medical face masks that are also cost-effective, washable and reusable. Amongst the types of fabrics commonly available, cotton cloth appears to have specific filtration advantages over synthetic fabrics such as polyester because of its unique physical and chemical characteristics. The antimicrobial properties of cotton fabrics can be further strengthened with a nanoparticle-coating over the fibre surface.

FACE MASKS MINIMISE THE CONTAGION

Surgical masks and non-medical face masks were found to be effective in preventing transmission of SARS-CoV-2 in aerosols by more than 95%[2]. Wearing of a face mask outdoors in Beijing during 2003 SARS was associated with a 70% risk reduction compared to those not wearing a face mask[3]. Personal protective equipment (PPE) such as face masks could play a key role in minimising the contagion[4-5].

RATIONALE FOR RECOMMENDING COTTON

The main criteria for face masks are filtration efficiency, pathogen obstruction and physical comfort of the mask including breathability. Cotton fabric has been found to be superior to all other fabrics in all these respects. Research papers point out that due to their unique physical, chemical and iso-electric properties, cotton fibres were found to be superior to synthetic fibres such as polyester and nylon in filtration and in being detrimental to viruses[6-9,12-14], pathogenic bacteria[7,15] and fungi[25] as well as in comfort and breathability[9]. Mounting scientific evidence supports the recommendation of cotton being the preferred choice in face masks for protection against a wide range of harmful microbial pathogens including coronaviruses such as SARS-CoV-2. This note provides a mini review of scientific references that drive the recommendation of cotton being best suited in face masks to minimise infection and spread of COVID-19.

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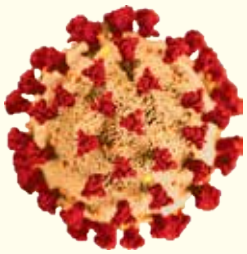


COVID-19 is a respiratory disease caused by a severe acute respiratory syndrome coronavirus named SARS-CoV-2. The virus is spread across humans through respiratory aerosol droplets released by infected persons. About half of the infections are believed to be transmitted by asymptomatic individuals[1].

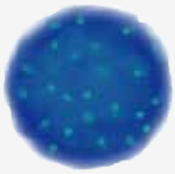
FACE MASKS MANDATORY IN 75+ COUNTRIES

By early May 2020, more than 75 countries comprising about 88% of the global population made it mandatory for the general public to wear face masks and 152 countries have recommended the use of face masks in public places either in some or all of the country, per Wikipedia.

USA AND INDIA HAVE RECOMMENDED DIY COTTON MASKS FOR GENERAL PUBLIC

Because of the acute shortage in the availability of surgical masks, government agencies in India and USA have recommended using fabric of tightly woven cotton fibres, such as quilting fabric, cotton sheets or T-shirt fabric, for preparation of do-it-yourself (DIY) home-made non-medical masks[4,10-11].

THE SCIENCE BEHIND COTTON FACE MASKS


Fungal spore


Bacterial cell


Virion

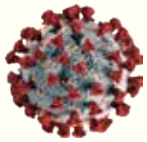

Polyester cloth


Cotton cloth

- NANOPARTICLE: The SARS-CoV-2 virus particle (virion) is a nanoparticle[16] with a diameter of 50 to 200 nanometers (nm).
- MASKS FILTER >300nm: By design, face masks effectively filter particles with a diameter of >300 nm.
- COTTON HAS SPECIAL PROPERTIES: At similar porosity, cotton can be superior to synthetic fibres such as polyester in filtering virions because of its special properties such as rough fibre surface, hydrophilicity (water absorbing) and higher iso-electric point. Synthetic fibres have a smooth surface.

COMBATING VIRUSES

Scientific evidence shows that cotton masks are significantly superior to synthetic material such as polyester in blocking viruses.



- FILTRATION: The median viral loads after coughs without a mask, with a surgical mask, and with a cotton mask were 2.56 log copies/mL, 2.42 log copies/mL, and 1.85 log copies/mL, respectively, thereby indicating that a cotton mask was better than a surgical mask in filtering the SARS-CoV-2 virions[17].
- Of the 15 different types of common fabrics tested for filtering aerosol nanoparticles, cotton cloth masks performed better than silk, chiffon, flannel, various synthetics and their blends[18].
- VIRAL PERSISTENCE: SARS-CoV survives longer in an infective form on synthetic-fibre-based disposable gowns than on cotton gowns[14].
- Recovery of human norovirus and feline calicivirus (FCV) was high at 5.59% on polyester but only 0.15% on cotton; murine norovirus (MNV) survival was 14.7% on polyester and 0.85% on cotton[8].
- Vaccinia and polio viruses (non-enveloped) were recovered from wool at up to 20 weeks whereas the viruses persisted for significantly far less time on cotton[13,19]. A combination of higher moisture absorbency and faster drying of cotton as compared to wool may have led to the lower persistence of the viruses on cotton fibres.
- The recovery efficiency (RE) of MS2 virus from polyester was 2.3% to 3.0%, significantly higher than 0.03% to 0.3% with cotton[7].
- BLOCKING EFFICIENCY: Of the 8 cloth materials tested, 100% cotton cloth had the highest virus-blocking efficiency compared to cotton blends and 100% ployester[20].
- BREATHABILITY: Cotton and cotton blends filtered 50.85% to 72.46% of the virions and 100% cotton T-shirt material was recommended as the most suitable household material for the preparation of non-medical face masks, also because of the ease in breathing compared to all other fabrics[9,21].

COMBATING BACTERIA

Tests conducted with 22 Gram-positive bacteria on five different hospital fabrics showed that 100% cotton was found to be significantly superior to cotton/polyester blends and 100% polyester in preventing the survival and spread of the pathogens[22-24].

COMBATING FUNGI

Five pathogenic fungi survived significantly longer (19.5 days) on 100% polyester, spandex, polyethylene and polyurethane but survived for less than 5 days on 100% cotton, cotton terry and blends[25].

WHY COTTON IS BETTER THAN SYNTHETICS

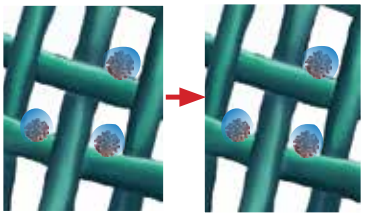
ABSORB, DEHYDRATE AND DEACTIVATE

The special properties of cotton cause a stronger attachment of virions to its fibres[26] followed by deactivation due to dehydration[6-8].

HYDROPHILICITY

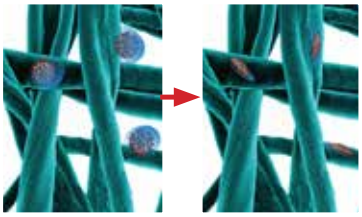
Cotton hydrophilicity is detrimental to virions. Cotton fibres are highly hydrophilic, which means higher water-absorbing capacity, whereas synthetic fibres like polyester are hydrophobic, so they repel water[27-28]. One gram of cotton fibre can hold 23.5g to 28.1g of water[29]. While non-enveloped viruses are less vulnerable to absorbent substrates, SARS-CoV-2 is an enveloped virus that needs moisture protection for it to be infective. Rapid absorption of water from the virus droplets of enveloped virions by cotton fibres hastens evaporation of the residual medium, removes moisture protection and renders virions vulnerable to dryness and desiccation. This contrasts with hydrophobic fibres of polyester in which water absorption is negligible and the virion remains intact due to longer moisture protection cover to the virus, which results in longer survival and continued infectivity. Therefore, the survival of pathogens and virions is higher on synthetic fibres compared to cotton[8] and as a result, a cotton-based face mask will outperform masks made out of synthetic fibres like polyester, particularly in the case of enveloped viruses like SARS-CoV-2.

POLYESTER FABRIC



Schematic diagram to show how virion-aerosol droplets remain on the hydrophobic fibres and survive.

COTTON FABRIC



Schematic diagram to show how virion-aerosol droplets are absorbed and the virions desiccate and dry.

ROUGH SURFACE AND ADHESION HYSTERESIS

With a size ranging from 50 to 200 nanometer (nm), SARS-CoV-2 virions could behave like typical nano-particles which often exhibit Brownian motion[30]. Compared to the smooth texture of synthetic fibres, cotton fibres have a rough surface with numerous nano-sized pores[31] that may serve as anchors for adsorption and adherence of nano-sized virions. The adherence of virions on cotton fibres may be further intensified by the impact of a phenomenon called adhesion hysteresis, which is defined as the difference between the energy needed to separate two surfaces and that which originally brought them together. These properties may contribute to the superior performance of cotton in filtering out virions relative to synthetic fibres.

ISO-ELECTRIC POINT

Cotton fibre has a higher iso-electric point (IEP) of 3.0 compared to that of polyester (2.3) and glass (2.1)[27,32], because of which viruses with an IEP of 4.9 to 6.0 have a lower survival and lower recovery efficiency on cotton compared to polyester and glass[6,8,33].

SMART COTTON MASK

A three-layered cotton mask sandwiched with-nano-impregnated cloth may offer excellent protection.

ANTI-MICROBIAL SMART COTTON FABRIC

Cotton fibres are amenable for coating with nano-particles that make them anti-microbial. Cotton cloth has been coated with nano-metals such as nano-silver, nano-zinc, nano-copper, etc., resulting in smart fabric with antimicrobial properties.

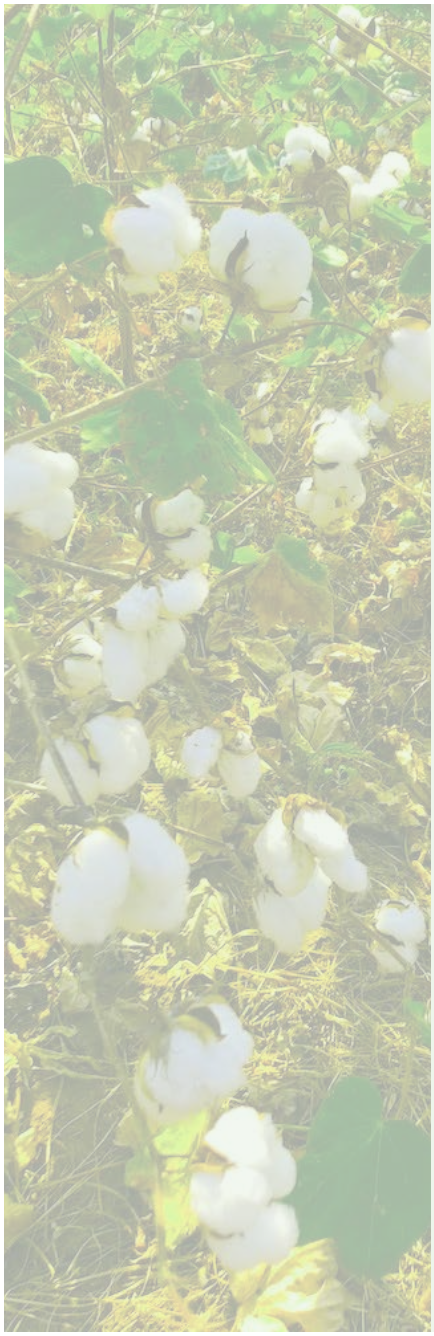
Nano-copper-coated cotton fibres showed broad-spectrum antimicrobial effect[34-36] including anti-influenza biocidal activity with clear breathability and no depletion in the antimicrobial activity after being washed[37-38].

Interestingly, highly cleaned and sterile unbleached cotton was found to have constituents that are beneficial to the hemostatic and inflammatory stages of wound healing. These properties were further strengthened by impregnation of nanometals[39-40].

BIODEGRADABLE

Being of natural origin, cotton fibres are biodegradable and can be the fibre of choice, especially for disposable items that can be safely discarded without causing environmental hazards.

Layout, design, illustrations and images: Keshav Kranthi, ICAC
Coronavirus: Stock image modified.



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