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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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References

Arivanantham, R, (2020) After lockdown- Salem Division of Southern Railway dispatches first consignment of cotton seeds to Punjab, earns Rs 27 Lakhs. Navjeevan Express Newspaper, **March 30, 2020,** https://navjeevanexpress.com/after-lock-down-salem-divn-of-sr-despatches-first-consignment-of-cot-tonseeds-to-punjab-earns-rs-27l/

Biswas, Parthasarathi, (2020) CCI operations start at slow pace as traders feel lockdown pinch. *The Indian Express*, April 28, 2020, https://indianexpress.com/article/india/cci-operations-start-at-slow-pace-as-traders-feel-lockdown-pinch-6383693/

Care Ratings (2020), Industry Research - Textiles Update – April 15, 2020 https://textilevaluechain.in/2020/04/15/care-rating-textile-report/

IBEF (2020) (India Brand Equity Foundation). Cotton Industry and Exports, March, 2020, https://www.ibef.org/exports/cotton-industry-india.aspx

ICAC, Cotton This Month, May 2020, https://www.icac.org/Content/PublicationsPdf%20Files/a8e3c9d4_103a_444f_b2d6_7b106089752a/cotton-this-month-e5_20.pdf.pdf

A, (2020) The great oil crash: Where is crude headed and what will be its impact. *The Hindu Businessline* April 11, 2020, https://www.thehindubusinessline.com/portfolio/big-story/the-great-oil-crash-where-is-crude-headed-and-what-will-be-its-impact/article31317942.ece

KPMG (2020) (Klynveld Peat Marwick Goerdeler) – Potential Impact of COVID-19 on the Indian Economy. (66pp), April 2020.

Kranthi K.R., (2014) Cotton Production Systems - Need for a Change in India. *Cotton Statistics and News*, 2014, 38, 4-7. Published by Cotton Association of India, Mumbai, 2014

Muthuveeran, Karthik, (2020) Coronavirus impact on textile industry. *The Indian Textile Journal*, March 30, 2020, https://indiantextilejournal.com/best-stories/Coronavirus-impact-on-textile-industry

Rathi Abhishek, (2020) Textile Monitor: COVID-19 Pandemic to Impact Margins and Credit Metrics. India Ratings and Research, April 6, 2020, https://www.indiaratings.co.in/PressRelease?pressReleaseID=40652&title=Textile-Monitor%3A-COVID-19-Pandemic-to-Impact-Margins-and-Credit-Metrics

Rutam, Vora and Vishwanath, Kulkarni, (2020) Cotton cultivation taking centre stage in North. *The Hindu Businessline Newspaper*, May 04, 2020, https://www.thehindubusinessline.com/economy/agri-business/cotton-cultivation-taking-centre-stage-in-north/article31503093.ece

Vastani , Hemant P., (2020) Impact of COVID-19 on Textile And Apparel Industry. Taxguru *Newsletter*, 13 Apr 2020, https://taxguru.in/corporate-law/impact-COVID-19-textile-apparel-industry.html