

# TEXTILE



CONFEDERATION OF INDIAN TEXTILE INDUSTRY  
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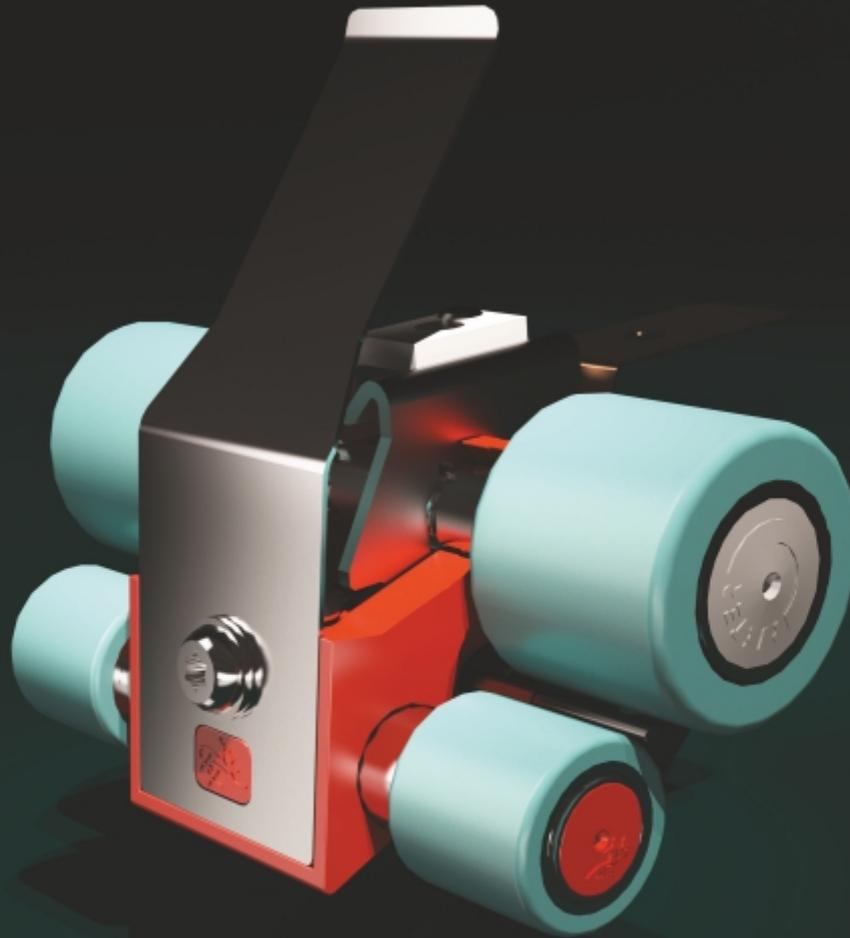
MAY - 2021



## SKILLS & RESEARCH IN TEXTILE INDUSTRY



# Make the Difference



## **COMPACTeasy – The new mechanical compacting solution**

The compacting device COMPACTeasy is attracting customers thanks to its low investment costs. COMPACTeasy produces yarns with excellent characteristics from all standard raw materials. This is based on the intensive double compacting that does not require any additional energy.

Friends, everyone has heaved a sigh of relief seeing that the impact of second wave of Covid-19 has started ebbing in most parts of the country! Many state governments have even initiated the process of unlocking some of the key industrial activities to sustain the growth momentum that we gained during the last quarter of FY 20-21 and return to the normalcy as quickly as possible as a damage control exercise. However, the cascading effect of the second wave on the economy is still a worrying factor and the actual damage caused will be ascertained in the coming days.

The official data released by NSO has pegged the Indian GDP at minus (-) 7.3% in FY20-21. However, keeping in mind the strong rural demand, expected normal south-west monsoon and nationwide vaccination process gaining momentum in the coming months, RBI has projected the GDP growth at 9.5% for FY 21-22. The CPI inflation is also projected at 5.1% for FY 21-22 amid normal monsoon with comfortable buffer stocks and recent supply side interventions. RBI has kept the Policy Repo Rate, Marginal Standing Facility and Bank Rate and Reverse Repo Rate unchanged at 4%, 4.25% and 3.35%, respectively to revive and sustain growth and for nurturing recovery at a faster pace. RBI has also announced a set of additional relief measures for MSMEs with a sole objective of reviving the economy and to mitigate the adverse impact of the second wave of the COVID-19 pandemic.

Amid this chaos, it is heartening that the Government has ramped up nationwide vaccination drive to inoculate its citizens aged above 18 and health infrastructure across both urban and rural areas to protect lives and livelihoods and prevent a resurgence in new waves of infections. I thank all the frontline warriors for putting their lives in risk to safeguard 1.3 billion Indian citizens. I sincerely express my heartfelt condolence to the bereaved family members who lost their beloved ones in this pandemic!

The RODTEP Scheme has been given effect from 1st January 2021, however, a formal notification specifying rates are yet to be announced by the Central Government. I have requested to the Hon'ble Union Minister of Textiles to also include Yarn and Fabric Sector into the scheme to bolster the left-out sectors to promote inclusive growth of the entire textile value chain.

RBI under the new guidelines for ECLGS 3.0, under ECLGS 4.0, has done away with the total outstanding loan limit of Rs. 500 crores and extended the benefit to the tune of 40% on total loan with a cap of Rs.200 crores. However, the textile sector which comes under ECLGS 2.0 is not getting this extended benefit. The textile sector already battered by Covid-19 pandemic and to support the huge investments made by the viable companies in the recent past to establish themselves into a vertically integrated units and achieve scale of economies to compete with nations like China, Vietnam and Bangladesh, I have requested to the Hon'ble Finance Minister and Governor, RBI that it would be imperative to support such viable companies at this juncture facing financial constraints due to pandemic induced lockdowns by doing away with condition of total outstanding loan limit not exceeding Rs. 500 crores as on 29.2.2020 and the maximum loan sanctioned may remain same at Rs.100 crores which is 20% of Rs.500 crores already permitted under ECLGS 2.0.



Friends, the Pradhan Mantri Kaushal Vikas Yojna (PMKVY) was launched in 2015-16 with an objective of filling the skill gap in the textile and apparel sector which is estimated annually around 3 lacs. However, till date only about 40,000 fresh candidates have been skilled under PMKVY. The two major reasons cited are 1) supply driven target allocation instead of demand driven and 2) scheme's guidelines not being conducive for textile mills (employers) to become Training Partners. After several representations made to MSDE and NSDC, now PMKVY 3.0 - Special Project route has been opened for captive consumption (demand driven approach) which allows employers and industry associations to directly approach NSDC for allotment of numbers and selection of job roles, instead of approaching District Skill Committees.

CITI, in order to create awareness and educate the textile industry about the benefits of PMKVY 3.0 – Special Project conducted more than 11 Webinars along with TSC and CITI Regional Associations. More than 1200 members of Regional Associations and EPCs participated in the Webinars and appreciated the changes brought in the PMKVY 3.0. CITI has submitted a proposal before the Government to work as a project implementing agency and help the sector reap the benefits of the scheme.

I recently attended an interactive meeting with the Department of Handlooms and Textiles, Government of Karnataka on the impact of Covid-19 pandemic on the textile industry and how the government and industry can overcome these challenges. I apprised the Secretary, Govt of Karnataka and Commissioner Handlooms and Textiles that Karnataka has enough potential in the textile sector and there are enough central sponsored schemes like MITRA, PLI and National Technical Textile Mission, ATUFS, SMARTH, etc. which can be taken up by the Karnataka Government for encouraging promotion of textiles in the State. I was happy to note that the Secretary and Commissioner were very appreciative of our suggestions and assured us to take into consideration all our suggestions for the overall development of textile sector in Karnataka.

I have also written to the Hon'ble Commerce Minister making an appeal for extension of period for fulfilment of Export Obligation and re-fixation of Average Export Obligation because the industry is facing many problems on the front of free movement of goods due to restrictions imposed through lockdowns by the state governments for checking the rising cases of infection due to second wave of Covid-19 pandemic. This has led to decline in the export of textile products in the previous financial year and making difficult for companies to fulfil their export obligation under EPCG Scheme.

However, I am very optimistic as far as textile exports are concerned as there is an upward swing witnessed on the export front in the last three months from March onwards, Government is also taking every possible effort to further enhance export basket of Indian goods and textile and apparel sector should take cue from this and work harder to take benefits of the current schemes introduced by the Central Government.

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The textile and clothing (T&C) industry plays a significant role in the Indian economy, being one of the largest and most important industries in terms of output, foreign exchange earnings and employment generation. The T&C industry is the 2nd largest employer in India after agriculture employing about 45 million people directly and 60 million people indirectly and hence training and skill development of the workforce plays a key role in achieving its production and export targets.

The Covid-19 induced lockdowns during the last two years had a massive blow to the textile and clothing industry, which is already reeling under a severe financial crunch. This has further led to an acute shortage of technically skilled workforce and low labour productivity in the Indian T&C industry. There is a dire need, especially after the Covid-19 pandemic, to create a pool of skilled resources that are industry-ready and upskill in-service professionals to sharpen the competitive edge of the textile industry. The businesses need a reboot plan to recover from this crisis and redefine themselves to emerge as a stronger and far more sustainable business than before the crisis. With technological modernisation being the key to high industrial growth, labour-intensive industries like textiles require a skilled workforce and massive vocational training for skill up-gradation of the existing workers engaged in the organised and unorganised sectors.

The government of India at the Prime Minister's level is also reviewing India's skill strategy to create a dedicated talent pool for the sectors covered under the Production Linked Incentive (PLI) scheme, and Textiles is one of the prominent sectors identified for the PLI scheme. The move comes after potential investors said that the productivity of the Indian workforce did not match global standards, thus impacting their cost.

One effect of Covid-19 is accelerated digital adoption. According to a NASSCOM report, from April 2020 to April 2021, 74% of skill development organisations shifted successfully to online models. Various reports by FICCI, NASSCOM and EY suggest that by 2022, 9% of Indians would take up jobs that do not exist yet, and over 37% of the Indian workforce may shift to opportunities that demand a radical change in skill sets. Demand for 'job-ready' skills in India will grow up to twenty times by 2024 (NASSCOM). Hence, the report suggests that "what we need at the moment is building resilience for the workforce with the right skills, and more collaborations with organisations to support skill-based hires".

Today, the Indian T&C industry is also facing challenges in regulatory and workforce pressures, re-engineering, managing change, and meeting world-class performance standards in productivity, price, quality, design, and innovation. Hence, the Indian textile industry requires skilled labour, quality standards for workers, productivity enhancement programs, vocational skill development programs, research and development (R&D) and adequate modern training infrastructure for skilling the workforce to overcome these challenges. Training the textile industry workforce at the shop floor and research levels are the need of the hour.

The new skills required to thrive in this new era are in short supply, forcing companies to examine their workforces' capabilities. The skill gap in the existing workforce and the lack of proper infrastructure to skill them in the Indian T&C industry threaten business growth.



With abundant availability of raw materials such as cotton, wool, silk, and jute, skilled workforce and manufacturing base in the entire value chain, India offers a favourable market for global retailers. The Central and State Governments have initiated many skill development and training programmes in the textile sector, especially in the last ten years. Indian T&C industry is working hard to achieve the US\$ 350 bn industry milestone set by the Hon'ble Union Minister of Textiles and Women & Child Development, Smt Smriti Zubin Irani Ji.

Pradhan Mantri Kaushal Vikas Yojana (PMKVY), Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY), National Apprenticeship Promotion Scheme (NAPS), and the recent Scheme for Capacity Building in Textile Sector (SAMARTH) aimed towards addressing the skill gap in the textile sector and also to supplement the efforts of the textile industry in providing gainful and sustainable employment to the youth are welcome and much-appreciated schemes by the Government of India. With these schemes and the overall support from the Government, the industry is highly hopeful that they will be able to impart the required skill sets to the workers to achieve the required productivity.

However, still, there is a significant shortage of skilled productive workforce which is the most critical parameter to achieve the production and export targets. Re-skilling, upskilling, and New-skilling (RUN) could be an essential solution to bridge the skill gap in the existing workforce. The way forward is to go for a structured re-skilling, up-skilling intervention for existing workforce & new-skilling for both existing and new workforce to enhance the productivity & quality of output. These initiatives will strengthen the competitiveness of the Indian garment industry in the international market, fetching more business. Not only this, India needs to benchmark skill practices with that of global leaders and also focus on international collaborations for skilling the Indian textile sector.

The Government, in association with the industry, may use experienced workers (specialists) to create a learning delivery program and use the older workforce to mentor and create a network of learning opportunities. Since the Indian T&C industry is looking towards increasing its market size in the coming years, training infrastructure available for each textile segment in our country has to be assessed and project the requirement till 2024-25. This assessment will provide detailed information on the present available infrastructure on each segment, course curriculum, faculty availability/requirements, and project the future requirements of each textile segment. There is also an urgent need to focus on research and development to integrate emerging technologies inventions in the Indian T&C industry. In this regard, the government can also support the Indian T&C industry by setting up more Centre of Excellences for different segments of the Textile industry.

Skilling has undoubtedly been one of the focus areas of the government and other stakeholders, and we hope that it would have sustained attention from policymakers. By 2025, India would have more than 860 million people in the employable age group of 20-64 years. Keeping this challenge in view, I am sure that the government would channelise the efforts and policies towards industry-relevant skill development programmes.



## SKILLING IN NEW LANDSCAPE OF INDIAN TEXTILE VALUE CHAIN & INDUSTRIAL REVOLUTION 4.0



**Mr. T Rajkumar**  
Chairman-CITI

It is pertinent today to look at skilling in the context of fast changing scenario post pandemic and in pursuit of fresh opportunities for growth of Indian textile industry. The Pandora of new opportunities is the blessing in disguise and has come at the time when India prepares for 75 years of her independence. It is noteworthy to mention here that today the Indian textile and clothing industry represents the complete textile value chain and consume almost all types of fibres. In these 75 years, Indian textile industry grew from a modest about 400 mills employing about half-a-million workers during independence to currently about 3,544 employing close to 43 million workforces. Today India accounts for 24% world spindles, 8% rotors, 63% looms and 37% world area under cotton cultivation. For the first time in her post-independence that India saw pandemic of this magnitude due to Novel Coronavirus which had witnessed shutdown of

manufacturing units, disruptions in logistics and severe straining of the textile supply chain. Noteworthy to mention here that still the textile and clothing value chain holds lot of promises for being the world's second largest producer, fifth largest exporter, and of-course second largest source of employment in India providing employment to about 120 million workforce accounting to 21% of the employment.

Despite all the adversities in the past one year, India has shown great resilience since the onset of covid-19 pandemic in March 2020. This is evident by the fact that in a noticeably short span it became second largest producer of PPE kits in the world, entrepreneurs flourished in all part of India and Start-ups on technical and medical textiles acted swiftly in delivering much needed technological innovations. While the global economies were in lockdown and the movement was restricted, a USD 1billion industry came into existence.

India which absolutely had no company for manufacturing PPE suits until now, is now having 1,100 companies thriving in this segment. These strengths are becoming the foundation to steer the textile and clothing industry, which has started reinventing the supply chain. Textile industry started looking from a different perspective to innovate, embracing appropriate technology, and resorting to new ways of working. With a strong, supportive and visionary Government at centre, India is all set to do wonder in the coming years and will surely achieve the target textile & apparel market size of US\$ 350 bn. Recently announced initiatives like, the Product Linked Incentive (PLI) scheme, SAMARTH, proposed textile Parks under the MITRA scheme, Capital subsidy under TUFS, and National Technical Textiles Mission, will enable the textile industry to become globally competitive, attract large investments, boost employment generation and exports. Out of the various advantages and strengths lying before us, it is worth to stress on few key areas in the textile value chain.

**The Technical Textiles** has been in focus since the time GoI promoted the centre of excellence (CoEs) at various textile research institutes across India. The Indian technical textiles industry, valued at USD 18 bn and growing at 13 % CAGR, has received a boost in demand post-COVID 19, especially the nonwoven textiles majorly driven by Healthcare and infrastructure sectors. GoI has been prompt in recognising this thrust area and introduced several incentives and support measures to boost the demand and attract investment in this sunrise sector. The National Technical Textiles Mission set up by GoI allocated INR 1,480 crore (US\$ 211.76 million) for the next 4 years till 2024. While the Production Linked Incentive (PLI) Scheme on Technical Textiles & Man-made fibres segments launched with an outlay of 10,683 crore (US\$ 1,528.53 million). Both of these along with the 207 Harmonized System Nomenclature (HSN) assigned by GoI will help in promoting India's technical textile industry which constitutes just 6% of the global market at the moment but growing at a faster rate of 12% against the global average of 4-5%. There are currently 364 Indian Standards on Technical Textile while more than 100 are under development. Also, the courses developed by the Textile Sector Skill Council, nurtured by CITI, have been included in the flagship program of the GoI, namely, the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and SAMARTH scheme. Training in these courses shall prepare the skilled workforce for the technical textiles, mainly for the blue-collar jobs. Recently Union Textiles Minister Smt. Smriti Irani has announced introducing academic subjects at National Institute of Fashion Technology (NIFT) on Technical Textiles involving production and

design of textiles in industries, apparel and decoration. Additionally, there are indirect driving forces brought in system such as making it mandatory to have the airbag mandatory for passenger in the front seat of a vehicle by the Ministry of Road Transport and Highways (MoRTH).

With these measures, India is expected to be a key growth market for the technical textile sector, expecting to reach US\$ 32 billion in FY23, due to cost-effectiveness, durability, and versatility of technical textiles. Looking at its emergence as a standalone driving force, there should be dedicated Export Promotion Council (EPC) on Technical Textiles, which can minutely address the deeper challenges of the emerging sector.

Nevertheless, due to the sudden emergence of the need for nonwoven in the health sector, focus got on production while the important aspect of quality and taking care of the carbon footprint were totally ignored. There lies a dire need for a greater sensitization among manufactures and the buyer; and establish protocols for the strict control on the quality as well as the qualification. It is apt and conducive for the textile industry and research association to come up with some initiative, such as, a formal certification course, awareness programs, etc., which can be appealing to masses with minimum cost of delivery. This could also help to channelise the abundance of knowledge and expertise among the professionals and academicians in the field of technical textiles.

**E-tailing** is yet another key area of emergence and is instrumental when it come to the post Covid phase. It has seen a sharp jump during the pandemic and has proved to be worthy model for a better growth in the sector. It is noteworthy that manufacturers could reduce the overheads significantly and is seen as new-normal in retailing. While the manufacturing continued with certain covid protocols, the logistics was seen as major hurdle. Adding to the fact that increasing access to Internet and general inclination of middle-class towards branded apparel, is another opportune factor for e-tailing. This shift is expected to drive, not only the growth of the domestic apparel and textiles sector to reach US\$160 billion by 2025 but will also provide significant employment opportunities. This demand driven employment will be further boosted by the rising spending limits in middle-class.

Although for the large-scale company it is not so difficult to put strong footing on e-tailing, which we have seen in few of the recent mergers & acquisitions. However, for the small manufacturers it is no easy to put up e-tail with reasonably good visibility or trust. Hence, a collaborative approach of working is need of

the hour for small to medium scale manufacturers working in cluster to setup the e-tailing and healthily compete with large companies. Notable example for this could be the clusters like Surat, India renowned for manufacturing sarees. Or the hosiery manufactures in Tirupur cluster. Hence, it is a need of the hour to identify the new skills and capacity build the youth engaged in these areas.

**Fibres** been an important value chain requires a special focus. The MMF is proving to be a silver lining for the textile industry and its consumption have gone up looking at the usage in products such as in nonwoven in large volumes. India has already started working on major initiatives, including setting up five integrated mega textiles parks, a world-class testing lab and starting a focussed product scheme, to position the country as a global hub in the man-made fibre (MMF). With a special focus on the sericulture with due support from GoI, India is hoping to be self-reliant in silk production by 2023. At the grassroots Central Silk Board is building the skills for a sustainable quality and productivity in silk production. However, equal focus is required for post yarn value added processes aimed for better earnings and calls for continuous skill upgradation programs.

**Industrial Revolution 4.0** in textile is going to impact the labour market in either or combination of four ways, namely, some new jobs would be created; some of the existing jobs would demand additional skill sets, while some jobs would continue to exist without any change in skill sets and some would disappear.

As per the recent study, the Routine Manual (RM) or Routine Cognitive (RC) skill jobs would disappear and shall be automated. However, the Non-Routine Manual (NRM) and Non-Routine Cognitive (NRC) skill jobs will continue to survive with or without additional new skill sets.

A survey conducted by Textile Sector Skill Council in 2018 covering 41 Job roles, engaging more than 80% of workforce, in organized textile mills has shown a shortage of 2,46,186 skilled manpower of which close to 80% is in spinning sub-sector. With automation there is likely to be loss of job such as over the period of 1980-2017 which saw the drop-in average operative hours per 100Kg of yarn from 52.1 to 18.3. During that period 65% of spinning jobs disappeared. Despite this, during the same period the number of persons employed in spinning has gone up from 3.27 to 5.1 lac due to increase in production capacity from 1298 to 5,667 million Kg production.

Among the two sectors, Textiles and Garments, the latter has already stated experiencing technologies such as intelligent transportation systems, robotic

handling devices, automatic folding machines and 3D garment design, leading to reduction in workforce especially in job roles such as helper, fabric checker, fabric cutter, packer, presser and finisher, which are relatively laborious. However, at the same time is giving rise to new skills, leading to new jobs, say for AI expert, designers etc. Hence, industry must start to gear up in identifying the new skill sets or additional skill sets to get ready the skilled work force in time. A best way to cater to these is through the apprenticeship promotion scheme of GoI which through recent reforms has been made employer friendly, highly incentivised and easy learning ground for person, where an individual can learn and earn simultaneously.

So far adoption of new technologies by Indian garment industry had been slow due to relatively low labour cost when compared cost of installation and maintenance of these technologies; unavailability of skilled workforce to operate them and inadequate infrastructure facilities; and shrinking profit margins due to stiff competition from neighbouring and underdeveloped countries. So, at present, the investments on some of these new technologies are not making good business sense (IRR). However, in near future, these new technologies will enter Indian garment industry.

As for the textile mill, much before the idea of Industry 4.0 was conceived, spinning machine manufacturers had replaced some of the job roles which require RM and RC skills with robotics (to substitute humans and replicate human actions). For example, auto doffers on ring frame, material handlers such as Link Coner, Auto Can transport and Chute Feed Cards, Autoconer etc. The automation to replace material handling and adoption of new technologies in fabric manufacturing have taken place much before Industry 4.0 has been thought of by other manufacturing industries. With the introduction of shuttle less looms, the pirn winding department and its jobs have disappeared. Replacement of manual colour preparation by colour kitchen in a dye house is an example of “job loss” due to automation.

In the current time, it may not be feasible for the Indian industry to adopt full state of the art technology due to relatively young age of the developed infrastructure. However, to overcome the labour shortage and readily reskill\upskill, adopting an “appropriate technology” is more plausible option before the industry. Due to the new skill sets getting added to many of the existing jobs by the advent of Internet of Things (IoT) and with a need for improving productivity, a good opportunity lies ahead to skill youth under the various skilling initiative programs of GoI. New skill sets shall be required to interpret real time data captured by smart devices, such as for, predictive Maintenance; and warning

***Shri T. Rajkumar, Chairman, CITI while attending a meeting convened by Hon'ble Chief Minister, Government of Tamil Nadu with the Industry representatives held at 5.00 pm on 09.05.21 at Chennai regarding Covid-19 Lockdown restrictions imposed by Govt. of Tamil Nadu during 10.05.21 to 24.05.21***



system for Production Manager when efficiency drops below desired level; to interpret multiple corrective measures recommended by the software based on inbuilt algorithms on past historical records. This will give rise to new job opportunities in form of specialists in areas other than textiles, such as, 1) specialists to monitor the organization's resource foot print - water, energy, chemicals etc., for sustainability; 2) meeting international market needs and to minimize cost of production; 3) Data specialists for optimizing business processes while shifting from Reactive models to Predictive models; 4) Specialists in PLC maintenance due to advent of specialised electronic components in almost all types of textile machines. The current trend of engaging these specialists shows that they will be working as freelance specialists rather than working as full-time employees and thus will be an advantage for manufacturer.

To have industry 4.0 to best of advantage, the academia needs to be geared up to address new skill requirements and need to focus on “Thinking, complex problem solving and decision making” rather than employability-enhancement skills. They need to keep pace with rapidly evolving technology to reduce rate of obsolescence and enable individuals to be future ready. New customized courses offering flexible timings should be floated in academic institutions to encourage students for towards life-long learnings.

While we think of industry 4.0, we must think of the parallel opportunities and smooth redistribution of jobs. Luddite Fallacy, which evolved after the incidence involving a group of English textile workers violently destroyed powerlooms (1811-1816), has shown that advent of New Technologies does not lead to overall unemployment but temporary structural unemployment. Due to the omnipresent disruptive technology in form of machine learning, Internet of things (IoT) and Artificial Intelligence (AI), there could be labour displacement but without an increase in long term unemployment. Notably, Textile industry had already adopted these in condition-based maintenance (CBM), automating the inventory management and production reporting, and managing a complex process involving large number of variables.

The future looks brighter for Indian textile value chain as the country has already geared up and started adapting Industry 4.0 in its manufacturing processes. In view of the new challenges for the textile industry, it is necessary that the business leaders and the managers understand its implications and prepare a roadmap to successfully integrate the manufacturing, supply chain, marketing to achieve Industry 4.0 compliance. Skilling must be seen as an integral component of manufacturing with an equal focus on re-skilling/up-skilling. The industry through well skilled workforce, will also overcome all the expected hurdles and will lead the global textile market in the future to come.



# RESEARCH AND DEVELOPMENT BY TEXTILE RESEARCH ASSOCIATIONS (TRAS) AND THEIR CONTRIBUTION IN THE GROWTH OF INDIAN TEXTILE INDUSTRY



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## Overview of Indian Textile and apparel industry

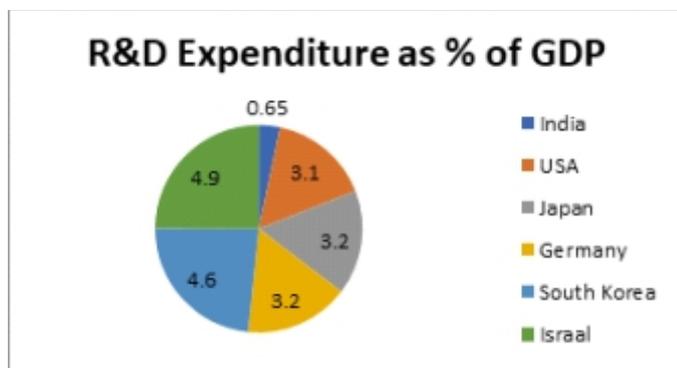
Textile and apparel industry is one of the most important industries in India. It contributed 2 percent to GDP of India and 11 percent in the total manufacturing of Gross Value Added (GVA) in 2019-20. This sector is estimated to provide direct and indirect employment to over 100 million people, thus making it the second largest employer, next only to agriculture. Structurally there are only very few vertically integrated textile companies that has manufacturing facilities covering the entire textile value chain starting from spinning, fabric manufacturing, chemical processing, and apparel manufacturing. Majority of the fabric manufacturing (weaving and knitting) and apparel manufacturing comes under MSME category and close to 95 percent of fabric production takes place in these MSMEs

(handloom, power-loom, knitting). Even many spinning units also come under the MSME category. To help these MSME units and spinning mills textile research associations were formed at the clusters where MSMEs are concentrated as co-operative research centres.

## India Vs the World – Expenditure on R&D

In general, the expense towards research and development in India is one of the lowest in the world. India's gross expenditure on R&D is 0.65 per cent of Gross Domestic Product (GDP), significantly lower than top ten economies which spend 1.5 to 3.0 percent of GDP on R&D. USA spends 3.1%, Japan 3.2%, Germany 3.2%, South Korea 4.6%, and Israel 4.9% to name a few. Globally, if we consider top 50 companies, on the basis of expenditure on R&D, not a single

company produces textiles. They are majorly involved in software development, pharmaceuticals, automotives and electronics. Same picture prevails in India. Very few textile manufacturers have their own R&D unit that is capable of developing new technologies. Most of the R&D teams are engaged in product development based on the requirement of a particular customer or based on competitors' products.



### Role of Textile Research Associations (TRAs)

Due to the very nature of industry and its requirements, the TRAs have been involved in conducting applied research and development activities for over 50 years. The textile industry has immensely benefitted from such developments.

### Broadly the developments undertaken by TRAs can be categorised into following:

- **Indigenisation of products**, mostly technical textiles, available elsewhere in the world. Indigenisation of such products considering the environmental conditions (like heat, dust and humidity etc in different parts of India) as compared to European and other cold countries. Also making it price competitive for the Indian customers.
- **Development of low-cost technologies** which can be retrofitted on existing machines. Due to very low profit margins, many textile companies are unable to invest in buying new and modern machines having similar technologies developed by TRAs. They found these developments highly useful as these could be retrofitted on the machines they already had.
- **Development of technologies** which help the industries in reducing energy consumption, waste percentage and in

improving the quality of products and machine efficiency.

- **Development of testing instruments** which are useful in evaluation and improving the quality of products. Though some of these instruments were already available in developed countries, their exorbitant price and very high cost of maintenance deterred the industry from importing them.
- **Development of innovative products** by using natural fibres, available in India.
- **Consulting services**, based on the findings of the R&D activities, the TRAs offer **consulting services** to the industry and help them in reducing cost of production, energy consumption and waste by recommending suitable solutions. R&D activities also help in solving their problems by using earlier experience.

The Ministry of Textiles, Government of India (MoT) is playing a very important role in nurturing the TRAs, and through the TRAs, the MoT has helped industry by providing indigenous testing and R&D facilities. When azoic chemicals were banned MoT set up Azo and Eco-testing facilities in these laboratories. Using those facilities, TRAs developed many techniques and provided alternatives to the industry for problem-free exports to European countries and Japan. The MoT sanctioned many R&D projects to the TRAs which helped the TRAs to popularise the developed technologies in textile industry with no or minimum cost. This helped the textile units to compete with ever-improving foreign manufacturers and the Indian companies were able to export Indian textile and apparels to the rest of the World. Today, India is the fifth largest exporter of T&A products in the World with a value of US\$ 36.4 billion in 2019. The export market size is predicted to be US\$ 65 billion by 2025-26.

### How TRAs conduct their R&D activities

Besides Government sponsored R&D projects, the TRAs also undertake in-house and contract research activities. The TRAs conduct Research Advisory Committee (RAC) meetings annually that are attended by senior industry experts. These meetings provide a unique platform to TRAs scientists to present their research activities and helps in generating new research ideas for the benefit of industry. Besides the formal RAC meetings, regular informal discussions takes place with industry experts that again help in generating new ideas for R&D activities. R&D projects that can be carried out with low-to-medium budget, is



taken as in-house projects. If the developments are useful for a particular company, contract research is undertaken and the part of the research expense is borne by that company. In such a case, the research output is shared with the sponsoring company only.

Innovation/invention plays an important role in the growth of any company. The inventions can be subdivided into low-level inventions, with low risk or high-level inventions, with high risk. With both options the commitments to develop the innovation comes down to the market knowledge, technical experience and gut feeling. Generally the five steps taken during development of product or technology are - opportunity identification, design, testing, introduction and life-cycle management.

There is an increase in demand of technical textile products in India due to improvement in quality of life and exposure to the products elsewhere through social networking, electronic media and international travel. Many a times, the Government agencies import such items for their people and over a period of time come to know that many of such items are not suitable for Indian climatic conditions.

### **Indigenisation of products**

The demand for clothing that is comfortable to wear without compromising on the efficiency is increasing continuously in India. NITRA along with private entities is engaged in developing such products and after successful completion the technologies are being transferred to the private entities for commercial manufacturing. The benefits of such products include lower cost than imported products, use of domestically manufactured raw materials for their development and comfortable to wear/use in Indian conditions. For example, recently NITRA has developed Work wear for cement porters and transferred the technology to M/s Arvind Ltd, Ahmedabad. Similarly it has developed Multi-layer flame and thermal resistance fabric for fire-fighter clothing and transferred the technology to M/s Arvind Ltd, Ahmedabad and M/s Aeronov Industrial

Safety Appliances, New Delhi for commercial production. NITRA has also developed improved stab and impact resistant material for anti-riot body protector and transferred the technology to M/s Applied Systems, Mumbai. Considering the problem faced by para-military forces in wearing Polyester/cotton blended fabric, NITRA developed Nylon-Cotton (NYCO) blended fabric and standardised its dyeing/printing technique. Nylon has more moisture regain than polyester (4% against 0.4% for polyester) and it has better abrasion resistance which increases the comfort level as well longevity. In the beginning a renowned company from Mumbai started using the technology but with time several other companies started producing this fabric. Similarly many products which used to be imported earlier have now been developed by TRAs, keeping in mind India's climatic conditions. These are now being commercially produced successfully in India, resulting in import substitution and savings in foreign currency. In many cases these are being exported to countries where similar weather condition prevails. As a result of extensive research work by TRAs and technology/knowledge transfer, most of the textiles product requirements of Army, Navy, Air- Force and Para-military forces are met by domestic Indian manufacturers in line with "Make in India" policy of the Government of India. A number of products such as geo-textile and agro-textile products need to be designed based on the soil quality, load to be imparted and local weather conditions. Products such as shed nets for water harvesting, smart shed nets etc will help in achieving "doubling the income of farmers" in India. These have been developed by different TRAs and have been utilised widely in India.

### **Development of low-cost technologies**

A large number of Indian textile companies do not make enough revenues and profits that they can replace their machines frequently with the development of newer technologies. TRAs developed retrofit-able technologies and being sponsored by the Government, the technologies have been transferred to many agencies. These agencies have helped the industry in improving quality, increasing productivity without making substantial investment. Some examples are improved let-off and take-up mechanism for powerlooms, pick finding systems, auto-shed levelling system for powerlooms and old auto-looms, high-speed cams for circular weft knitting machines, fabric take-down mechanism for hand operated knitting machine etc. Many of these developments form part of in-situ loom up-gradation scheme under "Powertex" scheme of the MoT and a large number of power loom weavers got benefited from them.

### **Development of Energy-efficient technologies**

Good number of developments have been made by the TRAs to reduce cost of production by reducing power consumption such as energy efficient pneumafil fans for carding, simplex and ring frame, energy efficient control system for automatic cone winding machines, energy saving drive system for ring and doubling frame, energy efficient textile spindle oil, energy efficient control system for humidification plants, centrally managed energy management system, monitoring of pressure drop of air pressure due to leakage in compressed air line etc. These have been implemented by a large number of units in India and the units have benefitted immensely with a very short pay-back period.

### **Development of testing instruments**

Most of the specialised textiles testing instruments are very expensive which restrict their uses by the T&A industry. TRAs have developed many such instruments which are being extensively used by the textile and apparel industry. This helped the industry to save cost and at the same time improve the quality of their products. For example, NITRA has developed Electronic drape meter and transferred the technology to M/s Dinu Technologies, Coimbatore, and Fabric smoothness tester and transferred the technology to M/s Multiflo Instruments Pvt Ltd, Navi Mumbai etc. Recently NITRA has developed Synthetic blood penetration tester for PPE kits and licensed the same to M/s Asian Test Equipments, Ghaziabad. Similarly, other TRAs also developed low-cost Indian instruments based on Indian and International standards which helped the smaller industries in implementing in-house quality control thereby improving the quality of their products and reduce rejections or seconds.

### **Development of innovative products**

The World is looking towards circular economy, low carbon emission, recyclability, biodegradability in all the products. Textiles and apparels are not an exemption. India has a rich and well established system of using natural fibres, natural dyes from time immemorial. TRAs have been working in widening the use of these fibres, dyes and new natural materials so that the value-added products can be produced thus giving higher income to the artisans and rural people. NITRA has developed patented technology to extract textile grade fibres from pine needles, which is one of the major causes of wild fires and generally treated as waste. Similarly it has extracted fibres from corn husk



to produce to textile products and composites. Also TRAs has worked on Pineapple leaf fibres (PALF), Banana fibres, diversified use of jute fibres and many of them has become commercially successful. A large volume of work has been done on effluent treatment, optimisation of use of chemicals, dyes and salts in the chemical processing to reduce the effluent load and help industry in achieving pollution control norms. Recently NITRA has set up a common effluent treatment plant for handloom and handicraft cluster at Bhuj, Gujarat using its R&D experience under Handicraft Mega Cluster Mission (HMCM) of the MoT. The plant has become highly successful. In this plant waste water will be used for washing and other functions after removing the dyes and chemicals.

### **The Way Forward**

In research and development some projects may not be successful in terms of their commercialisation while others will be. Under present conditions many of the textile units are not in a position to take that risk. Assistance from the Government of India will be of great help to the industry in providing jobs to the people of India. It will help the industry directly if MoT continues to support the TRAs in upgrading their laboratories, sponsoring research activities etc like it did for last fifty years. Work in the area of futuristic textiles and apparels such as smart textiles, nano technology, plasma technology, waterless dyeing, high-end technical textiles, development of speciality fibres will continue in TRAs besides addressing the on-going issues faced by the conventional textile and apparel industry. Support from the Government and industry will help the TRAs in coming out with successful products to meet the future demands of textile industry.

***Mr T Rajkumar, CITI Chairman, Mr Ashwin Chandran, SIMA Chairman, Mr Ravisam, Deputy Chairman, SIMA and Mr SK Sundararaman, Vice Chairman, SIMA attending a Meeting with Hon'ble Tamilnadu Chief Minister, Shri M. K. Stalin and donating Rs. 2.25 crore contribution made by SIMA Members to CM's Relief Fund for Covid-19 Pandemic.***



## CITI CHAIRMAN, SHRI T RAJKUMAR DELIVERED THE KEY NOTE ADDRESS

# ON THE 33<sup>rd</sup> FOUNDATION DAY OF THE NORTH INDIA SECTION OF TEXTILE INSTITUTE (NISTI)

North India Section of Textile Institute (NISTI) observed its 33rd Foundation Day on 24th May 2020. NISTI organized a webinar titled "Textile Industry's Revival with Growth - Looking Ahead" on this occasion. CITI Chairman, Shri T Rajkumar delivered the keynote address on the topic titled "Indian Textile Value Chain and Industrial Revolution 4.0" on this occasion.



Speaking at the event CITI Chairman, Shri T Rajkumar emphasized the importance of the Textile & Apparel Industry in the Indian economy and how the T&A Industry has started looking from a different perspective to innovate, embracing appropriate technology, and resorting to new ways of working. He said that among the two sectors, Textiles and Garments, the latter has already started experiencing technologies such as intelligent transportation systems, robotic handling devices, automatic folding machines, and 3D garment design, leading to a reduction in the workforce especially in job roles such as helper, fabric checker, fabric cutter, packer, presser, and finisher, which are relatively laborious and hence industry must start to gear up in identifying the new skill sets or additional skill sets to get ready the skilled workforce in time.

His address lasted for about 15 minutes and was well received by the organizers and participants of the webinar.



## RUNWAY TO SKILL DEVELOPMENT



**Dr. Darlie Koshy**  
Chairman-NISTI

Current approaches to skill development need to be revisited and revised to do things differently to achieve desirable outcomes. This becomes essential keeping in mind the informal and gig economy where most jobs will get created. How do we envisage an inclusive approach where the rural and urban India can complement each other and strive for leveraging the demographic assets as India will soon turn 75 in 2022? Let us begin by looking at how one of India's large districts has embarked on a project that can pave the way for relaunching skilling on a new RUNway!

### **The One District One Product (ODOP) Project in Uttar Pradesh**

“One District One Product Summit-2018” organized by the Uttar Pradesh government in Lucknow pointed to the pressing need for job creation by searching for new

models of skill development linked to the traditional handloom, handicrafts and other natural clusters. The

The Chief Minister's vision to exploring the possibility of implementing a similar approach in one of the most populous States in India with about 20 crore people soon became a reality. With 16.5% of total population of the country, Uttar Pradesh contributes about 8.4% to the GDP and was ranked as the third largest economy in 2015-16. Through ODOP, the state has brought out a comprehensive list of 75 products for the 75 districts promising 5 lakh additional employment for youth in the state every year. E-Commerce major Amazon has signed up with the Government of Uttar Pradesh to promote the ODOP- products.

Hon'ble Chief Minister Mr. Yogi Adityanath, in his inaugural address reminisced that it was one of his visits to Japan and later a visit and interaction at Bangkok that inspired his team to conceptualize and implement ODOP. Japan had introduced “One Village, One Product” (OVOP) in 1980 and Thailand had implemented the 'entrepreneurship stimulus program' between 2001-2006 by the name “One Tambon (Sub-district) One Product” OTOP.

Internal Trade (DPIIT), Government of India, is actively involved in promotion and marketing of Gis.

How does employment get generated for these products? At the outset, these products are the best targets for infusing new designs and technologies by setting up 'Product Market Incubation Centres' in select districts. We can learn more from 'Design for District', an inspiring example from Italy which took place since 1999 when Polytechnico de Milano with



Agra  
Leather Products



Aligarh  
Locks and Hardware



Azamgarh  
Black Pottery



Ayodhya  
Jaggery



Amethi  
Moonj Products



Bareilly  
Zari-Zardosi

Source: ODOP website

For a country like India, with such a large population expected to surpass China by 2030, gainful employment to the youth is certainly a matter of serious concern. There is an urgent need for alternate models of employment generation. One of ways is to build an ecosystem around traditional products in natural clusters to bring in appropriate technologies with design, and market (business model) interventions to create demand for the products in India as well as in other parts of the world to usher in new employment and entrepreneurship opportunities. The products which are GI registered can benefit rural economy by sustainable livelihoods for artisans, farmers, weavers and other crafts persons. Traditional clusters like Agra Petha making and Leather footwear, or the 200 years old bangles industry in Firozabad and many others hold potential for substantial job creation. The Department for Promotion of Industry and

Lumetel initiated market research, design, technology and other interventions and monitored the implementation of the same in clusters closely.

During “World skills competitions' in Sao Paulo in 2015, over 1,50,000 school children were brought in batches to witness the competition in progress over three days is an example to recall.

Another way to expand the outreach is by involving the youth. We can get the youth, especially the students excited about the 'ODOP' movement by bringing the school / college students to see the ODOP exhibitions, to get inspired for bringing blue sky vision for these 'heritage products'.

Yet another idea is to introduce 'T-shaped' skilling model (**discussed in chapter...**), by focusing on both the breadth and depth of skills with an eye on functional and creative enterprises to promote a higher level of skill training than just entry level courses that are being promoted, at present.

### **Need of the hour: The RUNway strategy to skilling**

By 2022, when India turns 75, she will be representing about one-fifth of world's population. As per the available information, about 15 - 17 million new workers get added to the labour pool every year and predominantly they are absorbed in the unorganized sector with just about 3 - 4 million jobs or less available in the organized sector. Are we ready to face this

challenge by considering issues at both macro and micro levels? How prepared is our skilling infrastructure to cope with industry demand for skilled workforce?

Unless we change gears with a policy shift towards 'Reskilling, Upskilling and New skilling (RUN)' for existing formal and informal workforce and those in the unorganized sector and MSMEs, the country's skilling vision will remain myopic.

*About 5 million youth every year remain under-employed and have to be satisfied with ad hoc engagements in casual labour pool. As per several reports, the formally skilled workforce in India is just around 2%-3% as against 47% of China, 80% of Japan and 96% of South Korea. By the year of 2022, 25% of the world's total workforce will be in India and it is going to be a totally different context in a brand new world swept by Robotics and Artificial Intelligence and other exponential technologies unleashed by Industry Revolution 4.0.*

## **Reskilling**

Reskilling - skilling the existing workforce and preparing them for the new job roles

## **Upskilling**

Upgrading skills and knowledge in the existing job roles by learning new tools, processes and techniques

## **New Skilling**

Skilling in latest technologies and 21st century skills to become employable



It is time for the policy makers and stakeholders to adopt the RUNway strategy comprehensively. The recent reports indicate that India could miss the golden spot of demographic bulge if we do not accelerate the pace of multi-level skilling with an innovation agenda at its core. The dream of demographic dividend expected can turn sour and result in much disillusionment.

With the farm labour migration being one of the biggest challenges in rural economy, 'reskilling' of such labour assume unprecedented importance.

### Why Reskilling?

Any intervention in reskilling needs to be very close to the habitat of the beneficiary and traditional clusters, as in "ODOP" scheme, can help to catalyse the new "reskilling" movement.

For instance, the mechanized, electric-run potter-wheel may require only few hours of reskilling training whereas, certain Saharanpur wood products may require several days or weeks of retraining. The traditional community centric or artisan – led or industrial clusters transformed by technology, design, innovation-market interventions could be the focus of 'reskilling' in the clusters.

However, in the case of existing workforce in urban centres, 'reskilling' may have to go beyond. With the introduction of Cyber-physical systems coming to the fore there is need for existing workforce to acquire new generation of cross-functional, communication, creative and problem solving skills, which have moved to pre- eminence in the recent past and were listed as top of the ladder skills by the World Economic Forum in Davos.

As Mr. Mohandas Pai, Chairman, FICCI Skills Committee (2018) had rightly stated, such skills form the core of the skills for the top layer of the working population, while the next layer will need mostly skills of a lesser order. This argument that urban, semi-urban and rural skills vary not only in degrees but also in its very content, has merit.

The corporates need to certainly focus a lot on reskilling of the supervisory and even managerial workforce rather than just joining hands with the government only for entry level skilling programs.

As a matter of fact, the CSR spending needs to be integrated strongly with the 'reskilling' targets. Apparently, many Indian companies seem to grab the low hanging fruits, even when it comes to directing their CSR spending to address such challenges. As per a recent report in the Economic Times, at least 33

companies and one-third of firms on the S&P, BSE 100 list have fallen short of the required CSR spending as mandated by the Companies' Act.

Mr. Jayant Krishna, former COO, NSDC had rightly observed that CSR needs to run like business, implying that the right talent and the right thoughts are needed to create initiatives that can have a lasting impact.

It is therefore, necessary that 'Recognition of Prior Learning' (RPL) which is only giving just about 12 or 18 hours 'top-up' for Recognition of Prior Learning training to the existing workforce need to become a comprehensive "skill gap filling" intervention. A more value added RPL of at least 150 hrs at the bare minimum to 300 hours could lead to better outcome.

*'Reskilling' needs to be demand-driven and the companies and employers need to project the new skillsets coming up in their sectors and formulate the contents and relevant training tool kits to train the existing shop floor workforce, and supervisory cadres without being over protective about the talent so trained as they could switch jobs and seek greener pastures. Compassionate and enlightened capitalist approach will help.*

### Why Upskilling?

Innovation based economic development as Richard Bendis, Founder - Innovation America, describes, upskilling of the entire workforce, systems and managerial cadre will be a critical dimension. Upskilling is relatively nascent and rudimentary in the Indian context unlike many countries where it involves continuous upgradation of skills through On-the-Job Training (OJT).

However, in the Indian Retail sector and in some large scale enterprises, we consistent efforts towards skill upgradation. In certain places, employers seems to be reluctant to even send their employees for training fearing that they would be poached by competitors.

*The upskilling strategy can be part of the CSR outlays and instead of broadly defining the CSR spending, it is important to persuade the companies to upgrade their own employees to face higher challenges of their sector especially in the areas of **speed, efficiency, productivity and above all innovation with design thinking.***

This fear psychosis have kept the existing workforce suppressed which require 'upskilling' for stretching upwards their capabilities in the emerging competitive scenario. In the absence of upskilling, they remain more or less at the same level of productivity throughout their service which is hurting the Indian manufacturing and service sectors.

### **New Skilling – what is in it?**

According to the fifth edition of CII's India Skill Report (2018), employability score has reached a new level of 45.60% up by 5.17% which if true, is indeed heartening.

However, the current 'New Skilling' thrust does not seem to be directed at the emerging scenario across the world of Industry Revolution 4.0.

A major strategy for New Skilling of the school and college students and fresh engineering professional cohorts need to be drawn up as is being done through Additional Skill Acquisition Programme (ASAP) in State of Kerala for Higher Secondary school children.



Thousands of new job profiles are born every day. For example, the Flipkart recently was recruiting 'Category Merchandisers' and the skills required are almost like combining 'numerical capability with high-level Sewn-Products Technology Skills' into one person. These were independent silos earlier.

Look at the way Industry 4.0 has impacted almost every industry sector. Myntra is reported to be using Artificial Intelligence in their fashion business. Even Fashion graduates need to now have a fusion of IT and Fashion skills to survive the e-commerce and online business paradigm.

The 'Ernst & Young – Future of Jobs Report' (2018) has predicted that there are three contemporary forces which are interplaying in determining the 'Future of Jobs' in 2022 in India i.e. (i) Clusters, (ii) Demographic Challenges and (iii) Adoption of Industry Revolution

4.0 with its exponential technologies. The workforce matrix for 2022 as projected by the 'Future of Jobs a 2022 perspective' based on the Research study by FICCI and NASSCOM indicate that 9% of the workforce would be deployed in totally new job profiles that do not even exist as of today.

*New Skilling will most likely to be more dependent on skills with cross functional problem solving and creative skills as key ingredients. Similarly, 37% of the workforce would be deployed in jobs that demand radically changed skillsets. This calls for both “Reskilling and Upskilling”, as the case may be.*

### **RUNway to skills and employment**

RUNway to Skills need to be seen very differently from the current 'Skill Missions' perspective of just entry level job training with 70% - 75% so called industry placement. This is imperative to overcome the fear of job loss where an entry level job role becomes redundant in the emerging automation scenario, thus, affecting the entire family's wellbeing, and even culminating in financial crisis.

In countries like UK, the system for skilling is built on a sustainable model with, loans free of interest, to pursue a skilling course in an authorized institution. The loan is repayable once the beneficiary gets a job and thereafter to keep upgrading oneself as the career progression happens with new tranche of loans.

The RUNway for employment to take off and to sustain rural economy and economic growth of the country as Amitabh Kant, CEO, NITI Aayog rightly emphasized, there is pressing need to hasten the rise of India in the Human Development Index. This means Higher

*With nearly 356 million in the age group of 15-24, Gen Next needs to have new skillsets keeping in mind the triple forces of change sweeping across the 'job scape' of the present and imminent future.*

Education Gross Enrolment Ratio (GER) and better skilled population with a focus on converting skills to competencies in the given job profile context fully optimizing 'creativity' of our population for continuous innovation, to usher in an innovation economy towards holistic economic development focused on people which might improve also India's Happiness Index from the current 133rd position (2018), for a better tomorrow, as the country moves towards its 75th post-independence celebrations in 2022.



# ARE FASHION STUDENTS READY FOR THE ERA OF DATA SCIENCE?

## A U.S. PERSPECTIVE



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**F**ashion is one of the most popular college majors among Generation Z in the United States. Over fifty U.S. colleges currently offer fashion-concentrated Bachelor of Science (B.S.) or Bachelor of Art (B.A.) programs. Graduates of these programs mainly pursue a career in the fashion industry, taking positions ranging from apparel design, merchandising, marketing, sales, branding to sourcing and supply chain management.

Meanwhile, due to the increasing availability of datasets of various kinds, from social media and consumer behavior to market intelligence, more and more U.S. fashion companies leverage data science and related analytics tools to improve their business operations. As the fashion industry becomes ever more data-driven, the type of talents required by the industry

and related skillsets needed are also quickly and fundamentally changing in nature.

**So, are fashion students enrolled in U.S. colleges ready for the era of data science? Is there a need to update the fashion curriculum and make it more relevant to the industry needs for talent preparation?** In this article, we take a detailed look.

*How is data science changing the fashion industry?*

With the increasing availability of data inputs of various kinds, from sales, social media to consumers' online shopping behaviors and the advancement of related data analysis tools, more and more fashion companies are leveraging data science and related

business analytics tool in support of their daily business operations.

**The usage of data science in the business aspect of fashion has been particularly popular**, such as supply chain management, inventory control, sales forecasting, and analyzing consumers' purchasing behaviors. For example, fashion companies have benefited from mass customization, i.e., making customized and personalized items on a large scale by leveraging data science. Through analyzing data inputs of consumers' purchasing history and demographics, data science-based mass customization allows fashion companies to more effectively cater to consumers' preferred style, fit, and color and meet their evolving demands.

In addition to business aspects, **fashion companies are also leveraging data science to improve or fundamentally change how they create new products**. For example, by comparing the fashion trends forecasts generated by WGSN and EDITED, researchers found that big-data tools have great potential to forecast fashion trends, particularly in the area of color and patterns.

Likewise, fashion companies have begun integrating data analytics and machine learning in their apparel design process. Some well-known fashion icons, such as Gap Inc., have attempted to remove the “creative director” position and instead use data scientists to design new products.

**Further, the combination of data science and fashion has attracted many new players, especially technology companies, to enter the fashion business**. These tech newcomers, such as EDITED, Trendalytics, and StyleSage, provide big-data-based analytics tools that help fashion brands and retailers analyze their sales, identify market-popular styles and product assortment, and optimize pricing strategies.

#### *Fashion jobs and data science-related skills*

The increasing usage of data science changes how fashion brands and apparel retailers design, merchandise, market, and deliver their products. It also affects companies' demand and skillsets expectations for talents.

**On the one hand, fashion companies' growing use of data science creates new jobs that did not exist in the past**. For example, an analysis of job openings by U.S. fashion brands and retailers posted on the Business of Fashion (BOF) from January 2019 to May 2021 shows that job titles such as “data editor,”

“data scientists,” and “smart inventory manager” were among the most in-demand. Notably, the job advertisements for these positions often explicitly require the applicants to acquire a solid knowledge of data science, such as “experience with Household Data, POS Data, Panel Data, customer analytics, web analytics,” “experience with large volumes of sparse categorical data, linear models and machine learning,” and “proven experience in areas of optimization, statistics, machine learning, and inventory theory.” The qualified applicants also need to demonstrate the ability to analyze and interpret fashion-related datasets using statistical, analytical, or data mining tools, such as “working with data and interpreting numbers,” “apply concepts of profitability and statistical inference to practical situations,” and “communicate findings and data science concepts clearly to both technical and non-technical audiences.”

**Meanwhile, with the widespread usage of data science in almost all aspects of a fashion company's business operations, even the expectation for traditional “merchandising” and “design” positions are gradually adding data-related new requirements**. For example, recent studies show that conducting a statistical analysis of sales data and demand forecasting has become an integral part of fashion buyers' essential job responsibilities today. Likewise, fast fashion retailers have been increasingly expecting their designers to use business analytics tools and consult quantitative data inputs in the design process. According to some job post websites, analyzing and interpreting data inputs is more often listed as a job responsibility for entry-level positions in fashion merchandising and design areas.

#### *Fashion programs in U.S. colleges*

As a result of academic units reorganization over the past decades, undergraduate fashion programs in U.S. colleges use a great variety of names today, such as “Fashion and apparel studies,” “Apparel, merchandising and design,” “Consumer, apparel and retail studies,” and “Textile and apparel management.” These fashion programs are also affiliated with different colleges, ranging from human sciences, design schools, arts & sciences to business.

The difference in college affiliation reflects the “identity” of respective fashion programs and affects the particular academic resources accessible to them. Fashion programs housed under the college of business, in general, arrange their students to take more business-related courses, whereas programs under design schools can offer more specialized apparel design courses based on faculty's expertise.

**Fashion education in most U.S. colleges is also application-oriented.** Most American students who choose to pursue an education in fashion specifically select the fashion industry as their future career path. Thus, fashion programs in U.S. colleges feel they have a unique responsibility to prepare for students' employability and their thriving long-term career success in the fashion industry. Some fashion design schools, in particular, focus on improving students' hands-on experiences in the learning process. In recent years, more and more fashion programs in U.S. colleges have launched dedicated courses to enhance students' knowledge and awareness of sustainability, given its growing importance to fashion companies. As fashion brands and retailers increasingly favor job applicants with previous working experiences, fashion programs in U.S. colleges also start to require an internship experience before students' graduation.

*Do fashion curriculums expose students to data science enough?*

Given the application of data science in the fashion industry and the expected skillsets for the future workforce, data science-related courses in undergraduate fashion curriculums could include three major components:

- *Math and statistics courses:* prepare students' basic math and statistics knowledge
- *Data courses:* prepare students' data reading, coding, and analysis skills
- *Quantitative merchandising courses:* train students' quantitative reasoning skills and related software skills (such as using fashion industry-specific business analytics tools)

Recently, we examined the fashion curriculums from the top 50 U.S.-based undergraduate fashion programs, trying to understand what courses are typically required and whether the curriculums sufficiently prepare students' data-science-related skillsets. As shown in Table 1, the results reveal some interesting patterns:

Type of courses	Fashion design programs	Fashion merchandising programs
Math and statistics courses	4.1%	3.9%
Courses dedicated to data and data analysis	0.3%	0.8%
Quantitative merchandising courses	1.1%	7.7%
<i>Data science related courses subtotal</i>	<b>5.5%</b>	<b>12.4%</b>
Non-quantitative merchandising	13.4%	36.5%
Design courses	29.8%	5.9%
Free electives	6.1%	7.6%

Data source: Compiled by the authors

**First, fashion curriculums in most U.S. colleges remain “traditional.”** Typically, fashion majors in U.S. colleges need to take “common core” courses like product development, textile science, trend forecasting, and fashion business basics. Fashion programs also assign different specialized courses for merchandising majors and design majors. For example, merchandising students usually need to take courses including retail buying, assortment planning, branding, fashion marketing, and promotion. These courses could take up to one-third of the curriculum credit requirements. Similarly, fashion design students usually have a heavy course load for conventional design or creative courses such as draping, pattern making, portfolio, and computer-aided design (CAD). These courses altogether typically account for 30-40% of the total credit requirements in the curriculum.

**Second, fashion programs in U.S. colleges have incorporated some but very limited data-science-related courses into their curriculums.** Notably, data science-related courses, on average, account for approximately 10% of the total degree required credits in the fashion curriculums. This includes 4-5% of total required credits for **mathematics and statistics courses** and 5.2% of total required credits for **quantitative merchandising courses** (i.e., merchandising courses aiming to improve students' quantitative analysis skills.) However, the current fashion curriculums in U.S. colleges typically assign **less than 1% of their total credits for courses dedicated to data science and data analysis** (i.e., courses explicitly mention the word “data” or “data analysis” in their title or the course description.) The gap in the curriculum is notable.

**Furthermore, college affiliation and program type seem to impact how many data science courses in the fashion curriculums.** Specifically, fashion programs affiliated with the business school, on average, assign more data science-related courses (16%) than otherwise (9.7%). Meanwhile, fashion design programs, in general, ask students to take even fewer data-science-related courses (5.5% of total credit



requirements) than fashion merchandising programs (12.4% of total credit requirements).

#### *Better prepare fashion students' data science-related skillsets*

The findings of our analysis suggest that we need to do more to help fashion students better prepare for their data-science-related skillsets and meet the fashion industry's needs for future talents.

#### **First, we need to expose more data science-related content in the fashion curriculums.**

While many fashion students and faculty see fashion education about creativity and artistic skills, with the increasing usage of data by fashion companies, maybe it is time to change the mindset and treat data science as an essential component of the 21<sup>st</sup>-century fashion curriculum. Particularly, those design-oriented college fashion programs need to shift the culture of avoiding “math and numbers” and instead create more opportunities for their students to play with data and improve students' quantitative reasoning skills.

#### **Second, fashion programs could consider offering a more balanced course structure to develop students' data science-related skillsets more comprehensively.**

Notably, as our study found, most data science-related courses in current fashion curriculums are limited to *math & statistics courses* and *Quantitative merchandising courses*. While these courses help prepare students' competencies in basic math and quantitative reasoning skills, they may not directly improve students' data processing and data analysis software skills, which are also regarded as essential for the future workforce in the fashion industry. As the available learning

resources are limited, **fashion educational programs may consider building strategic industry partnerships to help develop related learning material and access state-of-the-art data analysis tools widely used by fashion companies.**

**Further, it's time to rethink or even reform fashion education in colleges.** Even though the fashion industry and the fashion job market have substantially changed, as the study found, traditional fashion courses still account for nearly half of the fashion curriculum's credit requirements in most U.S. colleges. Fashion programs may consider providing fashion majors with more flexibility in the curriculum to explore emerging topics growing in importance to students' employability in the fashion industry but beyond the coverage of traditional fashion courses, such as data science. Colleges may also consider launching new interdisciplinary fashion programs that target fast-growing but non-traditional jobs in the fashion industry, such as fashion data scientists. These new fashion programs may further appeal to students interested in the science, technology, engineering, and mathematics (STEM) discipline, resulting in an expanded and more diverse student body of fashion majors.

Additionally, whereas this study examined U.S.-based fashion programs only, it could be meaningful to explore how fashion programs in other parts of the world, such as India, have incorporated data science into their fashion curriculums. Comparing the differences and similarities of fashion curriculums across different countries can reveal the impact of data science on shaping the global fashion industry's big landscape and inspire new thinking on the future of fashion education.

# TRINJAN: WEAVING THE SOCIAL FABRIC WITH COMPASSIONATE WARP AND DEDICATED WEFT



**Ms. Rupsi Garg**  
Project Coordinator, Trinjan Kheti Virasat Mission



***“Weaving fabric on the loom is worshipping God”***

*Raunki Ram, Weaver, Khajurla, Phagwara, Punjab*

Raunki Ram, 72 belongs to a traditional weaving (Julaha) family and has been weaving since he was 14 years old. A few decades ago, his village had many weavers but now he is only one who is continuing with weaving, other weavers have left, joined other jobs and burnt the tools and equipment of handloom and hand weaving, thus converting the heritage and technology into fumes. New generation doesn't appreciate and value the heritage of traditional art and craft.

**T**RINJAN is an initiative of Kheti Virasat Mission (KVM), Punjab which is trying to revive the Rural Art and Craft in an Ecologically and Socially responsible manner. TRINJAN is a Punjabi word that means a common space for women usually for collective learning and teaching. Traditional Wisdom of art and craft like hand spinning, hand weaving, embroidery, rug weaving, etc. would get transferred from the elder generation to the younger ones and that is how this legacy would keep continuing through TRINJAN.

**Introduction-** Weaving fabric on handloom is a sophisticated process, it has multiple steps and one needs to be very calm and patient while carrying out different operations of weaving. It is a very time taking and energy intensive work which needs full attention and demands hard work. A person who really loves and appreciates her/his work can only do it. Handloom weaving is a big source of livelihood with dignity, joy and satisfaction of creativity for the hand weavers across the country but in Punjab we rarely find weavers who are earning a good income out of handweaving. This is one of the biggest reasons that weavers are not weaving anymore sitting in their homes and working proudly with dignity and freedom.

Jaitu is a small town/block in Faridkot district of Punjab that has about 6-7 Khaddar Bhandars (Handmade Products Shops) in the market, these used to be the shops for handicrafts and hand textiles. Now all of these centers have been converted to showrooms of machine made fast producing home textiles. Many weavers are forced to become daily wage laborers and got into other jobs. So, hand weaving once an important occupation in the society finds less or no relevance in contemporary times as all the transactions have become money centric.

Handicraft and handloom sectors have got disturbed due to the lack of supply of raw material also. Cotton is the basic requirement for hand spinning and hand

weaving in Punjab especially. Earlier, farmers would grow Desi Cotton which would be ginned and carded and women mainly would do the hand spinning on Desi wooden charkhas. Women are also weavers themselves and the spun yarn was given to the weaver family also for the weaving. Every household would have a handloom and fabric was woven for the household needs by people themselves.



Now women remember in their casual talks that how they would hand spin quintals and quintals of cotton sitting in TRINJANA. They would start spinning at 4 AM in the morning and could keep spinning till late in the night. One important point to highlight here is that it was not just a way of producing yarn, fabric, darri, basket etc. However, it was to express oneself through these creative handicrafts. Women did not have any formal education but in weaving the fabric and darri they would be very symmetrical and aligned. What beautiful designs and motifs they have created!



It is also noteworthy that hand, heart and head are applied together to create and contribute which gets linked to the physical and mental health of the artisans. When our body, mind and soul are applied together, it creates a balance in various aspects of life. Women would have an association and emotional aspect to it as they would weave, spin and embroider for their daughters and the next generation. TRINJAN has a folklore, celebration and festivity inherent to it which keeps the society intact and motivated. Now we are trying to redefine the TRINJAN which is inclusive to different sections of the society i.e., farmers, artisans, men, women, children, elders, young, consumers, researchers, designers and many more.

**Birth of TRINJAN-** Punjab is broadly divided into four Geo-cultural regions i.e., Majha, Malwa, Doaba and Poahd. Malwa region was known for its cotton cultivation although there was a time when cotton was cultivated in a much larger area. With the advent of irrigation facility and tube wells, most of the cotton got replaced with paddy as it has an assured market and remaining cotton growing area got converted into Genetically modified, Bt and Hybrid cotton which is supplied to the industry. The self-dependent and sovereign system of cotton cultivation and its processing at a village level in a decentralized manner with distributed economy got disturbed and the social relationships of different people in the society also felt a jerk.

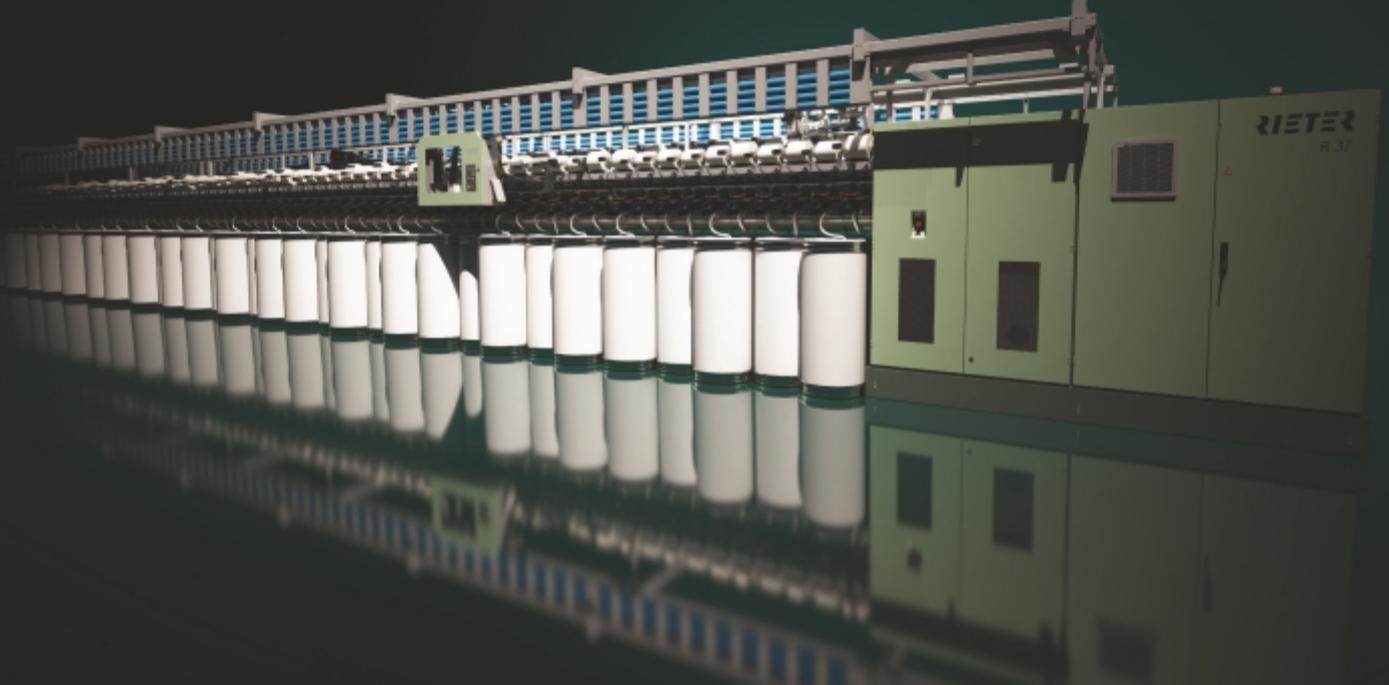
Considering all these points and understanding the importance of Native Organic Cotton which is suitable to the local environment and resistant to pest attack, KVM motivated the farmers to go for Organic Desi Cotton as they were already doing the Organic Farming and cotton is an important crop in Organic Farming as it should be multicropping and enhancing the biodiversity of a farm. Farmers associated with KVM grew organic cotton but it became difficult for them to find a suitable market for the organically grown cotton as the quantities were less and industry for organic cotton needs huge volumes to process. Therefore, farmers had to sell it in a normal market without any premium or compensation on organic cotton.

Along with working on organic farming with male farmers, KVM has been working with women through Organic Kitchen Gardens in Barnala, Faridkot and Muktsar districts where these women grow organic seasonal vegetables for their household needs and provide a Nutritional and Health Security to the family. KVM keeps organizing the public programs and festivals time to time on food, seeds, culture and other themes. Women are multiskilled and they can do the hand spinning also. It emerged that the organic cotton should be procured from the farmers on a premium

The RIETER logo is positioned in the top right corner of the page. It consists of the word "RIETER" in a bold, sans-serif font, with a stylized horizontal line through the letters "I" and "E".

RIETER

# Make the Difference

A large industrial spinning machine, the RIETER R 37, is shown in a factory setting. The machine is long and consists of many rows of white bobbins. The machine is illuminated from above, and the bobbins are reflected on the floor. The RIETER R 37 logo is visible on the side of the machine.

## R 37 – Economic rotor spinning for low priced raw materials

The new spinning box of the rotor spinning machine R 37 enables the efficient processing of a wide range of raw materials, particularly those with a high trash content. Together with the excellent spinning stability the R 37 ensures high-volume production. The robot ROBOdoff, which is available as an option, automates package change.

[www.rieter.com](http://www.rieter.com)

price (15%) and given to the rural women for hand spinning on desi charkha. We got the hand spun yarn and now the next steps needed to be determined. It was getting difficult to find the weavers but we kept searching and found a few weavers who are still practicing the weaving.

TRINJAN became an umbrella for the artisans for any art and craft they practice and want to work for. It's been built and evolving totally from the grassroots and today TRINJAN has about 300 different artisans associated with it. Many newer artisans want to get associated but due to lack of resources, infrastructure and other supporting systems we have not been able to engage a large number of artisans with us.

**Relevance of TRINJAN-** It is an attempt to build social and ethical economy where all the people involved have a security for their food and get respect for the work they are doing. It means one should be able to earn enough which is sufficient to fulfill her family needs and dignity and respect should not be compromised. Also, TRINJAN aims to create a platform where apart from becoming a producer one is able to get deeper into oneself using the art and craft as a medium and finds a direction and purpose in the life. Income generation and livelihood is one part of life but there is something which one does for oneself and it's for her own joy and satisfaction, it brings an inner transformation and happens gradually with lots of patience. To me, all these activities teach patience, uncertainty as many things happening around us are not in our hands so be calm and accept it without much turbulence and keep continuing with the stuff which is there for us.

Many beautiful, traditional activities and skills have vanished and are vanishing but I still see a lot of positive people and things happening around which shall be preserved and taken forward. TRINJAN is trying to conserve the seeds for our heritage and culture and hopes for a right time to get it germinated.

Most of the TRINJAN artisans: spinners, weavers, basket makers, darri weavers, hand embroiders are in their old age. Their health may not allow them to work for long years so involving youngsters and kids become crucial if this Art, Technology and Heritage need to be kept alive. It's a very challenging task as to youngsters these activities don't look attractive and financially viable but still, we are at it.

***“Teaching artisans is the responsibility of an artisan.”***

In different corners of Punjab, many skilled master artisans are working silently, TRINJAN is mapping these artisans as these are the only ones left for a particular craft. Kanta Khan is from village Manuke in

Moga district who does carding on a manual system. He chose to continue with this work as he wanted to work with his freedom and didn't want to leave his traditional occupation. Devraj, 75 years old is a Darri weaver in Nakodar Jalandhar, his wife helps him in the weaving. No other weaver is weaving darris on handloom in his area now.



Saphia from village Mour, Barnala, the only women weaver on fly shuttle frame loom, Gurnam Singh from Kotkapura, only one weaver from his town, Gurcharan Kaur, Shinder Kaur and Harjinder Kaur from village Kotli, Muktsar, Asha Rani and Banarsi Devi from Jaitu, Faridkot, Raveena Begum, Basket Weaver and a few more are showing us the way and possibility in handloom and hand craft sector.





Along with the artisans, farmers are an equal contributor to TRINJAN because if farmers would not have grown the Desi Organic Cotton this entire value chain of cotton cultivation, ginning, carding, hand spinning, natural dyeing, weaving, designing etc. could not have been explored.

**A way forward-** TRINJAN has established a base for connecting different dots of farm to fabric in the villages of Punjab. The efforts have been recognized by different individuals and collectives. TRINJAN has the potential to become a self-sustaining system of farming, clothing, education, health and livelihood in

the society. This is the high time that we as Indians understand the importance of our villages and village crafts, being Khadi and Charkha at the center of this village based distributed economy. TRINJAN is also about analyzing and utilizing the abundant locally available natural raw material and converting it into a usable product in an eco-friendly manner.

To me personally, it is a very good platform and medium for understanding one's existence and identity on this planet. TRINJAN has the scope of creating livelihoods, acknowledging the lost art and craft and artisans, doing innovations, research and development, developing new products, finding markets and consumers, support farm economy with the farmers, working towards slow and ethical fashion and having production by masses not the mass production.

*"Small is Beautiful and Manageable".*

We need to strengthen the organic cotton cultivation with the farmers and need to work on skill enhancement and product development with the artisans. Covid has delayed and cancelled many planned activities as these are not the normal times. We wait and hope for a good time when all these physical activities can be carried out and it shall help in marketing the TRINJAN creations also.

Association for India's Development (AID), USA has been a great support in building TRINJAN to this level.

TRINJAN is collaborating with Gherzi, the renowned Swiss consulting organization providing advisory services to the textile industry since 1929. TRINJAN-Gherzi collaboration is built on three pillars. It fosters supply chain linkages between organic cotton farmers in Punjab and textile mills; creating market access opportunities for women artisans for their handloomed products; thirdly, launching capacity building initiatives to inculcate best practices and improving competitiveness". 'KVM/TRINJAN-Gherzi' cooperation welcomes collaboration with the industry, international and domestic fashion and home textile brands, and multilateral development institutions to partner with the initiative.

TRINJAN is a concept which deeply adores and lives the sound, movement and living essence of Charkha and Handloom in its every moment and devotes it to the divine power.

*"I weave your name on the loom of my mind,  
To make my garment when you come to me."*

-KABIR



# TECHNOLOGY & SKILL BUILDING IN CLOTHING INDUSTRY: GHERZI EXPERIENCE



**Mr. Ashish Dhir**  
Gherzi Textil Organisation



**Mr. Halil Gökman**  
Gherzi Textil Organisation



**Mr. Razvan Ionele**  
Gherzi Textil Organisation

The clothing industry is dominated by big international brands and retailers who manage their business through complex and multi-tiered supply chains. The international buyers play a leadership role in the fashion supply chain. In the last 20 years Post-MFA (Multi Fibre Arrangement) the supply chains have become fragmented-geographically and in terms of decentralization of the manufacturing chain.

The main theme of this article is the use of technology and training for enhancing the skills in the clothing industry and improving the competitiveness of firms. Apparel making remains a highly skilled-labour-dependent industry. The authors being practitioners of garmenting technology will provide practical insights from their experience in leading garment firms and

clusters in Turkey, the Indian sub-continent, Africa and Europe. The readers will learn about demand-driven initiatives adopted by clothing firms.

## Demand driven dynamics

On 9th June, Inditex, the parent company of Zara, declared its results for the first quarter ended April 2021. It reported 50% increase in sales compared to the same period in 2020 attributing it to a 67% increase in online sales. This clearly shows the impact of digitalization on the clothing industry which in turn will be felt on the Tier 1 and Tier 2 of the supply chain.

The pace of digitalization across the clothing value chain has accelerated in the wake of the coronavirus pandemic. The need for speed and flexibility is

The biggest challenges are organizational in nature. Supply chains are made up of companies and people, and technologies are, at best, tools in the hands of users. It is not just the challenge of supplying goods to the specified quality, but of building in responsiveness and reducing lead times. This is because retail markets are characterized by volatility. Traditional approaches to forecasting consumer demand have become increasingly inaccurate with consequences of excessive cost. Reducing lead times is a major strategy for reducing risk. All supply chains are being asked to enhance responsiveness by looking critically at lead times and finishing ways to speed up the delivery of goods.

The industry has responded by investing in technologies.

Tyler

model which is a contrast to the conventional linear models with large inflexible production lines. The new modular lines can be rapidly assembled to balance the twin objectives of shorter lead time and shopfloor productivity.

#### Zara Approach

- Consumer focus to hear the 'voice of the consumer'
- Pull processes
- Speed takes priority over cost
- Flow in small batches
- Right-first-time systems
- Simple communication systems supported by ICT
- Change is constant

paramount. The following table shows a dramatic growth in online sales of leading clothing brands and retailers.

**Exhibit 1: Revenue of Top Fashion Retailers and online sales (FY 2020)**

	Revenue (\$Bn)	Share of online sales in total revenue(%)
Inditex	24.4	32%
H&M	22.3	28%
Fast Retail	19.0	15% (Future target 30%)
Gap	13.8	40%
PVH	7.1	24%

Source: Company reports

#### Micro production lines

In order to achieve speed and flexibility, many apparel manufacturers are setting up modular sewing lines. This flows from the lean and agile manufacturing principles that helps to respond to the 'Zara model' based on short product life cycles and new product launch every 3-4 weeks. Leading Jeans manufacturers in Turkey and Bangladesh have effectively adopted this

#### Sample Room

New product development lead times are a major challenge faced by apparel manufacturers. The need for better quality and shorter product development cycles is well appreciated. The sample room optimization was successfully implemented at a

**Exhibit 2: Sample room optimization (Bangladesh)**

No. of days	4 days	5-8 Days	9-12 days	>13 days
% of samples	66%	25%	7%	2%

Source: Gherzi case history

leading integrated textile and garment manufacturer in Bangladesh. It focused on the process and micro-analysis of activities being performed by various merchandisers and operators. A key factor of success in sample room optimization was to eliminate the conventional and rigid approach of departmental and functional framework in favour of a multi-disciplinary task force. In case of the Bangladesh producer, we were able to cut the sampling lead time from over 3 weeks to 4 days. Moreover the output was increased from 300 to 400 pieces/day accompanied by improvement in productivity from 1.39 to 2.04 (46%)

### Industry 4.0

Unlike in textiles (especially ring spinning), the scope for automation in sewn goods industry has been limited. However that may be changing with new frontiers in industrial automation. In 2012, SoftWear, an Atlanta based startup launched a project for successfully stitching together pieces of fabric robotically. The project earned a grant from DARPA, the R&D arm of the US Department of Defence. Around the same time, I-Team, a European start up engaged in FACTORY 4.0 and IoT software development for the apparel industry, introduced an Android based real time monitoring software implemented in Turkey, Bangladesh, Iran, Thailand. It fabric optimization and cutting management system, sample production,

production monitoring, maintenance and quality assurance system.

Product style and speed to market play a vital role in the rapidly changing apparel industry. Automated pattern making systems are now a norm in the apparel manufacturing industry. Today, CAD technology has enabled garment design, pattern making and product development to become mainstream. The intelligent pattern making (“AccuMark®”) technologies involving the creation of three-dimensional avatars from Gerber and Lectra have revolutionized the system of virtual modelling.

Another technology that is trending is digital twins. While the IoT based technology has been around for a while, of late it is being adopted by textile OEMs and producers for product design, marketing and training. So, what does it do? Well, a digital twin is a virtual representation of a physical product or process. It can simulate any aspect of a physical object or process and capture how the equipment operates, how engineers make it or the products made by the equipment. Side Effects, a Zurich-based startup has developed a “cost-effective 3D platform, providing real-time interactive solutions for production, sales, marketing, after sales and training. In a practical sense, textile companies and research institutes could use the technology for training their operators and students in a classroom enjoying a digital ambience!



Image courtesy: I-TEAM



### Capacity building

Several multilateral and international development institutions are providing technical assistance to garment manufacturers in emerging countries to impart skills to their workers and supervisors. This is being done through establishment of incubators, centers of excellence (CoE) and common facility centers (CFC). The ILO, in recognition of the changing eco system has launched an international initiative for upgrading skills for the changing world of work. The programme is targeting six countries in the middle east and sub-Saharan Africa.

Gherzi Consulting Engineers is partnering with global development agencies to provide technical assistance at firm and industry level. It has joined hands with DKTE's Textile & Engineering Institute at Ichalkaranji to implement demand-driven training programmes for vocational educational institutes in selected countries. According to Mr. Bijay Kumar Jha, the Sr. Garment

## ILO

SKILL-UP Programme is a joint effort of the International Labour Organization (ILO) and the Norwegian Ministry of Foreign Affairs aimed to help the ILO Member States enhance their skills systems to take advantage of new opportunities offered by emerging global drivers of change relating to increased digitalization, international trade integration, technological change, large international migration flows, climate change, demographics, among others.

Practice Expert at Gherzi, “the training programmes implemented in selected countries across Saharan Africa made a significant impact on the productivity and efficiency at firm level. In Mombasa Kenya, the skills development project benefited 10,000 operators and supervisors in 11 garment exporting firms, including MSME's.” he added.

Adoption of best practices in automation and digitalization in apparel manufacturing is vital to align our business models to the changing needs of the international clothing buyers. Upgrading the skills of the workforce should go hand in hand with acquisition of IoT tools.



# CITI CDRA's COTTON COLLABORATIVE PROJECTS DURING 2020-21



**Shri P.D. Patodia**

Chairman, Standing Committee on Cotton of CITI

India is known for commercially cultivating all the four species of cotton. Naturally cotton production in the country used to comprise of the production of all species of cotton. However, with the advent of G.M cottons and the introduction of Bt cottons for cultivation from 2002 onwards and its unprecedented adoption in a short span of time changed the composition of cotton production in the country. Now Bt cottons of superior medium (27 mm and 28.5 mm) and long Staple (29mm to 32 mm) account for over 93% of the total cultivated cotton area in the country. This has resulted in the mismatch between the demand and supply of cotton required by the textile industry. While Short, Medium and Extra Long Staple cottons are in short supply, there is a glut situation in respect of superior medium and long staple cottons. The country has made rapid strides in cotton production, production reaching all time high of 398 lakh bales in 2015-16. Now the country with the estimated cotton production of 360 lakh bales in 2020-21 enjoys the unique distinction of the biggest producer of cotton in the world and largest exporter after USA.

Shortage of high value ELS cottons in the domestic market has been the cause of concern for the textile mills. The demand for finer or ELS cottons in the country is placed in the region of about 15 lakh bales while domestic production is estimated at about five lakh bales. Besides, there is an increasing trend worldwide for going in for finer fabrics and with this trend continuing the requirements of finer count cottons is bound to go up further in times to come. The shortfall in this category of high value cottons is met by importing them from USA, Egypt, Sudan, etc at very high prices.

To remedy the situation, CITI CDRA has launched projects in **Maharashtra, Rajasthan, and Madhya Pradesh** to improve the ecosystem through sustainable use of soil, water, and external resources. CITI CDRA has partnered with local-level institutions,

e.g., Krishi Vigyan Kendra, for proper implementation of our projects among the farmers.

CITI CDRA's activities are mainly meant to improve the yield and productivity of the cotton, creating awareness among the cotton growers in the project areas about the latest production, plant protection, and Nutrient Management Technologies and equipping farmers with the latest technologies for sustained cotton production and improving the economic status of the farmers who are the weakest link in the cotton value chain.

At present, CITI CDRA projects are operative in Madhya Pradesh, Maharashtra and Rajasthan. The Project aims at:

- testing a flexible package of cotton in the local context to show reduced water, pesticide, and inorganic fertilizer use and increase farmers' gross margin.
- Working with farmers to encourage adoption and understand the problems arising
- publicizing the approaches widely and enabling further adoption.
- Supporting water basin management
- encourages demand for better cotton within the international framework.

## COTTON COLLABORATIVE PROJECTS IN MADHYAPRADESH

The cotton collaborative project in Madhya Pradesh was implemented in 4 clusters of Ratlam district , 4 clusters of Jhabua district and one cluster of Dhar district. In Ratlam district the clusters were Ratlam , Sailana Bajna I and Bajna II . Bajna cluster was divided in two parts ( I and II) in order to facilitate the project Scouts to implement the activities smoothly and

successfully . In Jhabua districts , the clusters were Jhabua, Ranapur , Rama , Petlawad and Thandla , where the project activities were implemented . In Dhar district. Dattigaon (Sardarpur) cluster was selected. All the clusters are growing ELS cottons and are contiguous forming the project area for carrying out different project activities .

**Training to the cotton growers** – The farmer training camps , Farmer Field Schools (FFS) , awareness camps were organized fortnightly for the cotton farmers in the project areas of Ratlam , Jhabua and Dhar districts to provide solution to the problem faced by them at different stages of crop growth and acquaint with the latest cotton technologies including INM and IPM. The KVK Scientist and officers of agriculture department were also invariably involved in these trainings. The members of gram panchayats including sarpanch also participated in these trainings more frequently. In FFS , practical field oriented trainings were given on identification of insect pest and

diseases , their nature of damage and symptoms on crop plants and management practices , conservation of eco-friendly insects, safe use of pesticides and clean harvest of cotton. During these FFS the farmers were also made aware about Economic Threshold Level of different pests, field scouting for observing the pest occurrence , principals of IPM including selective and judicious use of insecticides and insecticides resistance management . The farmers were also made aware about the physiological disorders in BT cottons and their management.

Similarly the field days and awareness camps were also organized in the project areas with the help of agriculture dep. The technical literature was also distributed to the cotton growers obtained from the agriculture department.

The following events and awareness programmes were conducted during the year 2020-21 , however the number of events conducted were comparatively on lower side than 2019-20 because of Corona pandemic.

**Table 1- District wise no. of events and no. of farmers participated**

Sr. no.	Events	Ratlam		Jhabua		Dhar		Total	
		1	2	1	2	1	2	1	2
1	Farmer Training	53	1896	39	1319	7	408	99	3623
2	FFS	42	1073	-	-	-	-	42	1073
3	Field days	15	355	-	-	-	-	15	355
4	Awareness camps	3	95	-	-	-	-	3	95
5	Mass awareness	-	15653	-	9173	-	1826	-	26652

1 No. of events ,2 No. of farmers participated



**Impact of CITI CDRA cotton collaborative projects in Madhya Pradesh**

The impact of different project activities in terms of seed cotton yield, reduction in no. of insecticidal sprays and technological awareness among cotton growers including clean harvest of cotton with better quality was observed in project areas. During trainings more emphasis was given on promoting adoption of low cost technologies by giving practical orientation on identification of insect pest of cotton , their life cycles , damage symptoms and management practices to be adopted through FFS , field days ,farmer trainings and day to day field visits by the project staffs and agriculture officers.

Continuous pest surveillance , conservation of Eco – friendly insects and method and time of their release for managing the harmful insects , use of bio – pesticides and their preparation, Economic Threshold Level based management of cotton insects resulted in reduction in no. of chemical sprays. The involvement of Sarpanch and other GP members and progressive farmers helped in boosting the morale of farmers resulting in quick adoption of many non - monitory technologies among the cotton growers .

The technological awareness about crop rotation, integrated nutrient management based on soil testing , timely gap filling and use of neem based bio pesticides helped in getting higher crop yields with reduction in environmental pollutions . Farmers were encouraged to avoid using extremely hazardous insecticides like MCP.

**COTTON COLLABORATIVE PROJECTS IN MAHARASHTRA**

2021 was sixth year of the Cotton Collaborative Project in Wardha district and third year in Yavatmal district and second year in Nagpur district and first year in Chandrapur District of Maharashtra. The CITI CDRA implemented it in association with the Divisional Joint Director of Agriculture, Nagpur Division, the Bayer Crop Science and the member mills of the Mill Owners Association, Mumbai. The Divisional Joint Director of Agriculture, Nagpur Division vide his letter dated 24-09-2018 granted the approval to the project for Wardha district for a period of three years (2018-19 to 2020 -21), without any financial support from the state government of Maharashtra.





# Webinar on **HOW TO GET MSP PRICE IN COTTON?**

**15th Oct 7pm to 8.30pm**

Jointly Organised by

**Cotton Guru**  
Cottonguru  
MahaFPO Limited

ISO 9001:2015

**CITI-CDRA**

## Speakers



**Dr. S.K. Shukla**  
Principal Scientist, CIRCOT,  
Nagpur



**Shri Govind Wairale**  
Former GM  
Maharashtra Federation



**Shri Ajaykumar**  
GM, CCI  
Akola



**Shri Arjun Dave**  
Dy. GM, CCI  
Aurangabad

## Host



**Mr. Manish Daga**  
Cottonguru  
MahaFPO Federation



The project aimed at empowering the project farmers with the latest production, plant protection and nutrient management technologies through continuous training and mass awareness created by frequently organising farm visits, workshops, seminars and village level meetings. It endeavoured to promote Good Agricultural Practices (GAPS) for enhancing yield, reducing costs of production and increasing cotton farmer's income.

In the Context of the large scale Pink Boll Worm attack on cotton Crop, leading to huge loss to the cotton farmers and a large number of casualties of farm labourers/farmers engaged in spraying of chemical pesticides on cotton Crop during the previous season, the CITI CDRA and BCS jointly organised a SPECIAL DRIVE for creating mass awareness regarding Pink Boll Worm and its control and also safe use of pesticides.

Besides, Front Line Demonstrations programme was implemented on farmer's fields to show case as to how by adopting the latest technologies production could be increased while reducing the cost of cultivation.

### IMPACT OF THE PROJECT ACTIVITIES ON COTTON YIELD AND PRODUCTION:

Average yield of cotton per hectare as worked out on the basis of randomized data of production of 20% project farmers in each of the seven clusters was found to be much higher than the yield data reported by the Agriculture department for 2020-21

Sr. No.	District	Taluka	LINT YIELD PER HECTOR OF PROJECT KGS/HECT	YIELD KG PER HECTRE AGRICULTURE DEPARTMENT	DIFFERENCE	
					KGS	%
1	Wardha	DEOLI	417	381	36	9.44
2	Wardha	HINGANGHAT	544	472	72	15.45
3	Wardha	SELOO	648	474	174	27.24
4	Wardha	WARDHA	381	328	53	16.15
5	Yavatmal	KALAM	433	366	67	18.30
6	Nagpur	KALMESHWAR	635	576	59	10.24
7	Chandrapur	WARORA	563	429	134	31.14

### Comparison of Project average yield with Maharashtra State Average yield lint Kgs Per Hectre.

Sr. No	District	Project yield lint Kgs/Hectare	State yield Kgs/Hectare	Difference Kgs/Hectare
1	Wardha	498 Kgs	333 Kgs	+165 Kgs
2	Nagpur	635 Kgs	333 Kgs	+302 Kgs
3	Kalam	433 Kgs	333 Kgs	+100 Kgs
4	Chandrapur	563 Kgs	333Kgs	+233 Kgs
	<b>Total Project Average</b>	<b>532 Kgs</b>	<b>333 Kgs</b>	<b>+199 Kgs</b>

### Use of cotton plant residues to increase income of Farmers with association of Agroplus Foundation

After harvesting of Kapas, cotton plants are uprooted & burnt in form or otherwise used as fuel. Instead of that, it is possible to add value by using cotton plant residues for farm composting, production of briquettes and pellets. There are NGO's working to educate farmers on this aspect and the project farmers are being brought in touch Agroplus Foundation, NGO's with a view to help the farmers in reducing cost of cultivation and increase their income..



# TEXTILE ENGINEERING EDUCATION

## DKTE's TEXTILE & ENGINEERING INSTITUTE

### **Prof. (Dr.) P. V. Kadole**

Director, Textile and Engineering Institute, Ichalkaranji

### **Prof. (Dr.) U. J. Patil**

HOD Textiles, Textile and Engineering Institute, Ichalkaranji

D. K. T. E. Society's Textile & Engineering Institute is one of the premier engineering institutes present in India & popularly known as "DKTE", located at Ichalkaranji city in Kolhapur district in the state of Maharashtra. Ichalkaranji was a princely state ruled by the Ghorpade dynasty for the last two centuries. In India, concept of decentralized powerloom sector was first implemented in Ichalkaranji by setting up the pioneer powerloom unit 1904.

In spite of the process of phenomenal growth of the textile industry which was taking place at Ichalkaranji at the end of 20th century, there was a lack of a dedicated vocational education institute until 1980 which could cater the industry's need of technically trained manpower. The local industry was handicapped due to the dearth of technically qualified personnel. The genesis and growth of DKTE institute was a sequel to the intense desire and support from the powerful cooperative sectors. Keeping in view the fabric of social responsibility, Mr. K. B. Awade, former

Member of Parliament, founded D.K.T.E. Society's Textile & Engineering Institute at Ichalkaranji in 1982. DKTE institute was started to cater to the vocational education in the field of Textiles & Engineering in order to provide educational facilities to the students of this rural area of western region of the Maharashtra State and also to support the growth of industry by providing technically qualified professionals. The DKTE enjoys a unique and prominent place amongst the institutions that are engaged in education, training, research and consultancy in various disciplines of engineering in India.

DKTE has played a pivotal role in the development of Ichalkaranji cluster as a one of the prominent decentralized textile sectors of India. In and around Ichalkaranji there are about 35 spinning mills, covering wide range of counts, folded yarns, ring and open-end yarns, and fancy yarns. These units are well equipped with state-of-the-art machinery, R& D and product development facilities for quality and better

productivity. Many of these spinning Mills are 100% Export Oriented Units. Thus, these spinning mills ensure easy availability of better-quality raw material (Yarn) required for weaving sector of this area. There are about 160 sizing units, consisting of 250 sizing machines, which includes conventional to modern machines and more than 1 lakh power looms in this decentralized sector. Such wide range of power looms are producing fabrics such as cambric, poplin, Dhoti, Printed Sari, Blouse, Interlining, Shirting, Canvas and Industrial Textile. Automatic shuttle looms are used to produce fabrics for school uniforms, made ups, medium weight industrial fabrics etc.

More than 35 power processes and about 80 hand processing units are fulfilling the needs of Ichalkaranji textile sector. Since increasing quality consciousness, the plain power looms were not suitable to fulfill the market requirement. Further, automatic looms were also not much able to sustain demands from global textile market. They were satisfying the middle level of textile market demand. Hence, it was high time that the textile entrepreneurs were required to enter into latest shuttleless weaving technology to adjust them with the domestic as well as international market.

Vice Chairman of DKTE Society and the then Textile Minister of Maharashtra State Hon'ble Mr. Prakash Awade played instrumental role in making the Ichalkaranji Textile Cluster as a High-tech shuttleless textile cluster by creating conducive atmosphere for the same through various schemes / policies etc. Moreover, DKTE created the awareness regarding shuttleless technology among all the textile entrepreneurs of the textile sector by conducting seminars, workshops, training and exposure visits for them. As a result of this, the significant number of entrepreneurs could shift themselves from the conventional powerloom technology level to a substantially higher shuttle less technology since 2001.

Currently, there are over 15,000 high speed shuttleless weaving machines installed in Ichalkaranji. Even, state of the art pre and post weaving processes are also installed in Ichalkaranji textile cluster.

The availability of a qualified manpower, technical knowledge and easy accessibility to best weavers of Ichalkaranji for outsourcing were among the factors that influenced Italian textile major Tessitura Monti, Turkish textile maker 'Soktas', Bombay Rayon Fashions Ltd (BRFL), Raymond Zambaiti Ltd, world famous German Men's wear brands Liebe, Boys R Bad and Looty etc. while planning investment near Ichalkaranji city.

The vision of DKTE is to be one of the leading institutes in technical education and research through academic excellence and innovation, to serve the needs of industry and society through continuing education programs, industry interaction, entrepreneurship development and incubation. DKTE Institute has been accredited with A+ Grade (3.53 CGPA) by NAAC. DKTE is two times winner of AICTE - CII Award. It is Best Industry Linked Institute in India. (2015 & 2017). All eligible UG programs offered by DKTE are accredited by National Board of Accreditation (NBA), AICTE, New Delhi. Textile Institute Manchester (UK) has also accredited the Textile Technology program of DKTE. DKTE has maintained tradition of providing 100 % placement to the students with excellent package.

DKTE has also provided international placement opportunities to the students in leading textile & apparel organizations. DKTE has state-of-the-art infrastructure facilities in workshops, laboratories and library. More than 15 industry sponsored laboratories are successfully set-up and being operated at the DKTE. DKTE has made collaboration with leading foreign universities for persuasion of higher education with stipend or seminar exchange internship.





International industrial experts also visit to the institute for delivering the expert lectures. The Institute has a spacious and modern library, designed to meet the burning needs of the budding technocrats. A specially designed multimedia library has more than 4000 video cassettes and CDs on recent machinery and equipments, case studies and management, etc. Separate internet facility has been provided in the library to facilitate students to have access to the worldwide information. Significant number of e-journals is also subscribed.

DKTE has conducted more than 400 Seminars / conferences / workshop to disseminate exhaustive knowledge related with the textile technology, quality control, maintenance, marketing, export – import, etc.,



for the development of local entrepreneurs since last 39 years. DKTE has also provided easy access to local entrepreneurs for any technical information, testing services, library, trouble shooting, turnkey projects, project preparation, project appraisal etc. DKTE has provided a platform for textile entrepreneurs to interact with domestic as well as international customers by candid participation in organization of Buyer Seller Meet. DKTE has produced world class technocrats & business managers to support & grow the textile industry across the country.

DKTE strongly believes that research is a tool for building knowledge, for facilitating learning as well as nourishment and exercise for the young minds. Since inception of DKTE, strong industry-institute interaction helped DKTE to update industrial trends

### Major projects sponsored by Government of India

Projects	Funding Agency	Total Grant (Lakhs ₹)
DKTE Center of Excellence in Nonwovens (CoE)	 Ministry of Textiles	2500.00
Technical Education Quality Improvement Programme (TEQIP)	 THE WORLD BANK Working For A World Free Of Poverty	697.20
Technology Business Incubation in Textiles	 Department of Science & Technology Ministry of Science & Technology	484.30
Development of Instrument for Handloom Fabric	 Ministry of Textiles	15.00
AICTE - SPDP Skill & Personality Development Programme Center for SC / ST Student.		11.65
Ichalkaranji Textile Development Cluster	 Department of Industrial Policy & Promotion Government of India Ministry of Commerce & Industry	700.00
TIFAC - CORE	 TIFAC	507.00

Scheme for Support and Development of SME's through Incubators	 MSME	62.50
MODROBS	 AICTE	12.39
Entrepreneurship Development Cell (EDC)	 AICTE	10.00
Entrepreneurship Development Cell (EDC)	 Department of Science & Technology Ministry of Science & Technology	45.00
Research Promotion Scheme (RPS)		29.50
MODROBS		55.80
TEDP	 Entrepreneurship Development Institute of India	14.83
NCP	 AICTE	22.50
FDP	 AICTE	10.00

and practical hand-on experience to faculty and students. Along with teaching and academic research leading to UG, PG and doctoral degree, the DKTE gives high priority to research and development projects. The approved research centers help in promoting industry interactions and be associated with real life current industrial or social challenges. The nature of activities being conducted are trouble shooting, product, process and design development, investigating problems relevant to industry, turnkey consultancy and socio-economic issues of the country. To enrich industrial participation in engineering

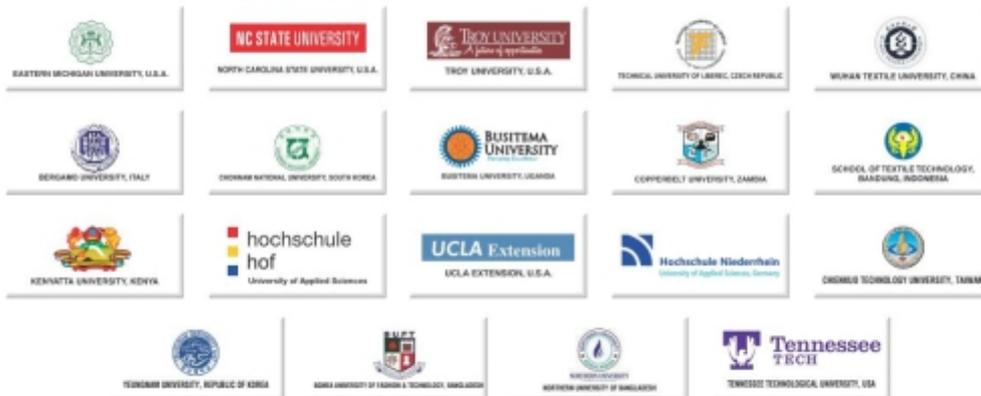
education, DKTE has initiated developing infrastructure including sponsored / funded facilities such as TIFAC-CORE in Technical Textiles; Technology Business Incubation with thirst area in Garment and Textiles; Italian Technology Centre for Textile machines; Rieter Spin Centre or Technology Centre; Entrepreneurship Development Cell, etc.

DKTE is actively involved in collaborative research with national as well as international industry or universities to remain as a leader in engineering and technical developments. A large number of

### MoU with Foreign Universities

#### Areas

- Faculty Exchange
- Student Exchange
- Joint Research and Publications
- Curriculum Development
- Sharing of Laboratories, Workshops and Library
- Consultancy for Industry
- Collaborative Programmes
- Joint Ventures
- Starting and Establishment of Textile Programmes
- Qualification Improvement Programmes
- Short term Training of Faculty and Supporting Staffs



### MoU with Industry

#### Areas

- Training of Technical Personnel, Faculty and Students
- Textile Machinery and Accessories Development
- Technical Support for the Sponsored Projects and other Areas.
- Exchange of Faculty and Technocrat for Dissemination of knowledge and Information
- Joint Research for Product Development, Process Development
- Job Training and Campus Placement
- Continuing Education Programme
- Sharing of Infrastructural Facilities
- Sharing of Human resources for Curriculum Development, Problem Solving etc.



collaborative MoUs are under operation. For promoting academic and research activities MoUs have been signed with industries and universities across the globe. R&D unit plays important role by providing one time seed amount incentive to new faculty for facilitating research, 100% funding for registration of patents as well as publication at journal of repute, 100% funding for presenting research work at international conference held abroad as well as attending national or international exhibitions.

DKTE has been awarded Government sponsored projects worth over Rs. 55.00 crores from different Ministries, Govt. bodies like Ministry of Textiles, TEQIP World Bank, DOIP, DST, AICTE, DRDO, IET, etc. DKTE has successfully established and is operating one of the prestigious projects worth Rs. 26.17 crores. The Center of Excellence in Nonwovens sponsored by Ministry of Textiles, Govt. of India was set up.

The Government of India has also sanctioned the Powerloom Mega Cluster Project with an outlay of Rs. 113.53 crores to be set up at Ichalkaranji. The objective of the project is development of the Ichalkaranji decentralized textile sector by providing assistance for infrastructure, common facility centre, and technology up-gradation, other need-based innovations and skill development etc. Government of India has selected the DKTE as a Cluster Management & Technical Agency (CMTA) for the successful implementation of powerloom mega cluster project at Ichalkaranji.

DKTE offers a number of following programs in the field of the textiles along with other engineering programs.

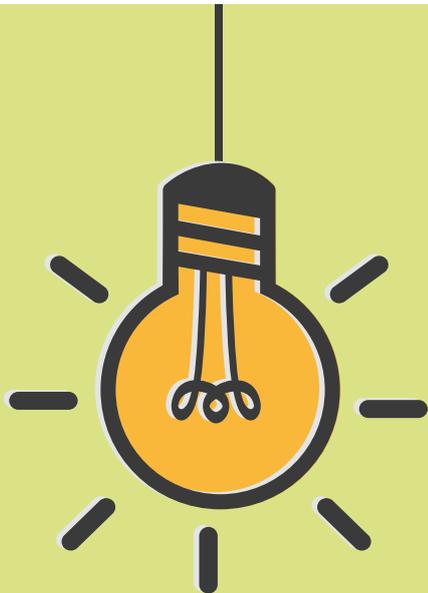


## Textile Programs

DIPLOMA
Diploma Course in Textile Manufacture
Diploma Course in Textile Technology
Diploma Course in Fashion & Clothing Technology
UNDER GRADUATE
B. Tech. - Textile Technology*
B. Tech. - Man-Made Textile Technology
B. Tech. - Textile Plant Engineering
B. Tech. - Textile Chemistry*
B. Tech. - Textile Engg. (Fashion Technology)
POST GRADUATE
M. Tech. - Textile Engineering
DOCTORATE (Shivaji University, Kolhapur Research Center)
Ph.D. - Textile Engineering

\* Additional quota for Foreign Students

As DKTE is providing exhaustive knowledge about complete textile value chain to the textile students with the total intake of around 400 per year from diploma to Ph. D. program which in turn results in passing out of around 7500 textile engineers and successfully contributing their best for substantial growth of textile industry at national and international level. Around 1500 textile engineers have started their own textile activities and providing employment to the people. It is worthwhile to mention that many of these textile engineers engaged in their own business have focused on advanced textile manufacturing activities such as technical textiles, export, garment and allied sectors instead of traditional textile sector owing to enriched textile knowledge gained during their textile engineering education. Today, DKTE alumni are working as a technologists, scientist, business manager, entrepreneurs etc. In doing so, they are contributing significantly to building of the nation and to accelerate the textile and allied industrialization around the world. In coming future, DKTE and DKTE alumni are committed to extend their best for serving the nation and resolving the problems confronted before the nation, society and industries. Textile engineering education in the DKTE has brought the laurels to the Institute and created image of the DKTE as an Institution of eminence.



# Textile INNOVATIONS

.....NEXT BIG THINGS AHEAD.....

## Closing the loop on single-use facemasks



### **Pilot project covered collection, shredding, pyrolysis and remanufacturing.**

SABIC teamed up with Procter & Gamble and the Fraunhofer Institute UMSICHT in a pilot project aimed at demonstrating the feasibility of the closed-loop recycling of single-use facemasks.

Due to Covid-19, the use of billions of disposable facemasks has raised environmental concerns especially when they are thoughtlessly discarded in public spaces. Apart from the challenge of dealing with such huge volumes of essential personal healthcare items in a sustainable way, simply throwing the used masks away for disposal on landfill sites or in incineration plants represents a loss of valuable feedstock for new material.

“Recognising the challenge, we set out to explore how used facemasks could potentially be returned into the value chain of new facemask

production”, said Dr Peter Dziezok, director of R&D and open innovation at P&G. “But creating a true circular solution from both a sustainable and an economically feasible perspective takes partners. Therefore, we teamed up with Fraunhofer UMSICHT’s expert scientists and SABIC’s technology and innovation specialists to investigate potential solutions.”

As part of the pilot, P&G collected used facemasks worn by employees or given to visitors at its manufacturing and research sites in Germany. Although these masks are always disposed of responsibly, there was no ideal route in place to recycle them efficiently. To help demonstrate a potential step change in this scenario, special collection bins were set up, and the collected used masks were sent to Fraunhofer for further processing in a dedicated research pyrolysis plant.

“A single-use medical product such as a facemask has high hygiene requirements, both in terms of disposal and production,” explained Dr Alexander Hofmann, head of recycling management at Fraunhofer UMSICHT. “Mechanical recycling would not have done the job. In our solution, therefore, the masks were first automatically shredded and then thermochemically converted to pyrolysis oil.

“Pyrolysis breaks the plastic down into molecular fragments under pressure and heat, which will also destroy any residual pollutants or pathogens, such as the coronavirus. In this way it is possible to produce feedstock for new plastics in virgin quality that can also meet the requirements for medical products.”

The pyrolysis oil was then sent to SABIC to be used as feedstock for the production of new PP resin. The resins were produced using the widely recognised principle of mass balance to combine the alternative feedstock with fossil-based feedstock in the production process. Mass balance is considered a crucial bridge between today’s large scale linear economy and the more sustainable circular economy of the future, which today is operated on a smaller scale but is expected to grow quickly.

“The high-quality circular PP polymer obtained in this pilot clearly demonstrates that closed-loop recycling is achievable through active collaboration of players from across the value chain,” said Mark Vester, global circular economy leader at SABIC. “The circular material is part of our Trucircle portfolio, aimed at preventing valuable used plastic from becoming waste and at mitigating the depletion of fossil resources.”

Finally, to close the loop, the PP polymer was supplied to P&G, where it was processed back into new nonwoven materials.

“This pilot project has helped us to assess if the close loop approach could work for hygienic and medical grade plastics”, said Hansjörg Reick, P&G’s senior director of open innovation. “Of course, further work is needed but the results so far have been very encouraging.”

The entire closed loop pilot project from facemask collection to production was developed and implemented within only seven months. The transferability of advanced recycling to other feedstocks and chemical products is being further researched at Fraunhofer.

## Bemis collaboration with 3M



### Rolls transformed into logos and other designs for apparel and footwear brands.

Bemis Associates is to distribute and convert 3M Scotchlite reflective materials under a new distribution agreement that will leverage each brand's capabilities to serve sportswear and activewear brands globally.

3M Scotchlite reflective materials help enhance the visibility of safety garments in lowlight conditions thanks to the retroreflective properties of thousands of microscopic glass beads incorporated into the material. Bemis transforms rolls of the material into logos and other designs for apparel and footwear brands.

"The collaboration between 3M and Bemis makes the most of the natural synergy between our companies, providing comprehensive solutions to a broader base of activewear customers," said Malou Marasigan, global business director and APAC area leader at Scotchlite. "In combination with the adhesive portfolio of Bemis, differentiated designs can be created."

Scotchlite reflective transfer films are intended for use on high-performance safety garments. The technology works by returning light rays back to the original source as a result of the retroreflective properties of the microscopic glass beads. Since very little light is scattered when the light is returned, retroreflective materials enhance the contrast of the wearer to an observer located near the original light source.

## Bio-based first from Solvay

### Company plans portfolio evolution in coming years.

Solvay is globally launching Bio Amni as its first partially bio-based polyamide textile yarn. The polyamide 5.6 is produced entirely at the company's textile industrial unit in Brazil.

The development of Bio Amni follows the growing global trend in demand for more sustainable textile products, especially bio-based materials. Solvay's research and innovation teams worked on the creation of the product for two years.

"Sustainability is one of the main drivers of the global textile market," says Antônio Leite, global vice president of polyamides and fibres at Solvay. "Solutions and products must add value to the entire consumer chain – from its base to end consumers of textiles – and have less of an impact on the environment. Solvay's Bio Amni is part of a portfolio evolution to offer customers the most innovative products on the market."

The textile sector currently faces three main challenges in relation to the environment and sustainability – resources, the production process, and disposal. Solvay has already developed sustainable alternatives in the production process, using cleaner energy sources, closed water circuits, and zero effluent emissions at its industrial unit in Brazil, as well as more biodegradable products to support more sustainable disposal. With Bio Amni, Solvay is now offering its first partially bio-based textile yarn, further expanding on its diverse portfolio of sustainable products.

With the launch of Bio Amni, sustainable textiles will now account for 30% of Solvay's global polyamide portfolio, a figure which the group expects to grow to 50% in the next three years.

In 2020, as a quick response to Covid-19, the company launched Amni Virus-Bac OFF, a functional polyamide that inhibits contamination between textiles and users, preventing the fabric transmitting viruses, including coronaviruses, and bacteria.

The company also created Amni Soul Eco, the world's first biodegradable polyamide textile yarn, which facilitates the decomposition of textile articles in about three years after disposal in controlled landfills.

With more than 23,000 employees in 64 countries, Solvay, headquartered in Brussels, Belgium, achieved sales of €9 billion in 2020.



**Sad demise of  
Shri S.A. Ghorpade, Advisor, CITI CDRA**



**CITI is deeply saddened to learn about the sad demise of  
Shri S.A. Ghorpade, Advisor, CITI CDRA.**

Shri T. Rajkumar, Chairman, CITI; Shri S.K. Khandelia, Deputy Chairman, CITI; Shri R.L. Nolkha, Vice Chairman, CITI ; Committee Members of CITI; Shri P.D. Patodia, Chairman, CITI CDRA Standing Committee on Cotton; Shri Prem Malik, Co-Chairman of the CITI-CDRA Standing Committee on Cotton; Members of Sub-Committee of CITI CDRA on Cotton and CITI Secretariat extend their heartfelt condolences to his family in this hour of grief and pray to Almighty to give strength to the bereaved family to bear this irreparable loss.

May the departed soul rest in peace in heavenly abode!

# MAJOR ACTIVITIES OF CITI

Confederation of Indian Textile Industry (CITI) and Textile Sector Skill Council (TSC) jointly with Regional Textile Mills Associations, conducted a series of Virtual Conferences from 5th -11th May 2021, for creating awareness among textile mills in availing the benefits of skill training under the recently launched Pradhan Mantri Kaushal Vikas Yojana (PMKVY 3.0) Special Project. A large number of regional associations, namely, SIMA, TEXPROCIL, RTMA, Spinners Association of Gujarat (SAG), MANTRA, MPTMA, APTMA, TASTMA, SISPA, and NITMA, were instrumental in mobilizing a large number of textile mills and bringing them on the virtual conference platform to discuss the scheme details, requirements, and benefits. More than 1,200 members of regional associations and Export Promotion Councils have participated in the VCs and appreciated the changes brought in the new version of the PMKVY Special Project. As a result of this, CITI was successful in convincing the industry to participate wholeheartedly in the PMKVY Special Project. The industry assured providing placement to more than 90% of the trained candidates.

Mr. T Rajkumar, Chairman, CITI along with other office bearers of CITI, namely, Mr. S K Khandelia, Deputy Chairman and Mr. R L Nolkha, Vice Chairman, took a keen interest in steering the VCs and encouraged the textile mills to actively participating in the scheme. Dr. J V Rao, CEO, TSC, Dr. Vijay Yadav, Director, TSC and Dr. Swapna Mishra, Director, TSC apprised the industry about the scheme details, requirements and benefits, and the process to apply.

Following Webinars on PMKVY3.0 were Jointly organized by CITI, TSC and Regional Associations as per details given as under:



**VIRTUAL CONFERENCE ON  
SKILL DEVELOPMENT UNDER PMKVY 3.0**  
Date: Wednesday, 5th May 2021 | Time: 4:00 pm Onwards

... ——— KEY SPEAKERS ——— ...

 Dr. Swapna Mishra Director (C&T), TSC	 Dr. J.V. Rao CEO, TSC	 Shri T. Rajkumar Chairman, CITI	 Shri S.K. Khandelia Deputy Chairman, CITI and Past President & CEO, Surlej Textiles & Industries Ltd.	 Dr. Vijay Yadav Director (Operations), TSC
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**WEBINAR ON PMKVY 3.0**  
JOINTLY ORGANIZED BY CITI, TSC AND REGIONAL ASSOCIATION  
DATE: SATURDAY, 8TH MAY 2021 | TIME: 4:00 PM INDIA

... ——— KEY SPEAKERS ——— ...

 Shri S. K. Khandelia Deputy Chairman, CITI Past President and CEO Surlej Textile and Industries Ltd.	 Shri R. L. Nolkha Vice Chairman CITI	 Shri S. N. Modani Chairman RTMA	 Dr. J. V. Rao CEO TSC	 Dr. Swapna Mishra Director (C&T) TSC	 Dr. Vijay Yadav Director (Operations) TSC
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### WEBINAR ON PMKVY 3.0

**JOINTLY ORGANIZED BY CITI, TSC AND SAG**

DATE: MONDAY, 10TH MAY 2021 | TIME: 11:30 AM INDIA



#### KEY SPEAKERS



Shri Biplob Patel  
Vice President, SAG



Shri Saarim Parikh  
Chairman  
Spinners Association Super (SAG)



Shri R. L. Nodha  
Vice Chairman, CITI



Dr. J.V. Rao  
CEO, TSC



Dr. Swapna Mishra  
Director (C&T), TSC



Dr. Vijay Yadav  
Director (Operations), TSC



### WEBINAR ON PMKVY 3.0

**JOINTLY ORGANIZED BY CITI, TSC, MPTMA AND MANTRA**

DATE: MONDAY, 10TH MAY 2021 | TIME: 05:00 PM INDIA



#### KEY SPEAKERS



Shri Akhlesh Rathi  
Chairman MPTMA



Shri Bharat T. Gandhi  
CMD, Batsori Textiles  
and Trustee, MANTRA



Shri S. K. Khandelia  
Deputy Chairman, CITI  
and Past President & CEO,  
Satej Textiles & Industries Ltd.



Dr. J.V. Rao  
CEO, TSC



Dr. Swapna Mishra  
Director (C&T), TSC



Dr. Vijay Yadav  
Director (Operations), TSC



### WEBINAR ON PMKVY 3.0

**JOINTLY ORGANIZED BY CITI, TSC AND NITMA**

DATE: TUESDAY, 11TH MAY 2021 | TIME: 04:00 PM INDIA



#### KEY SPEAKERS



Shri Mukesh Tyagi  
Vice President, NITMA



Shri Sanjay Garg  
President, NITMA



Shri R.L. Nodha  
Vice Chairman, CITI



Dr. J.V. Rao  
CEO, TSC



Dr. Swapna Mishra  
Director (C&T), TSC



Dr. Vijay Yadav  
Director (Operations), TSC



### WEBINAR ON PMKVY 3.0

**JOINTLY ORGANISED BY CITI, TSC AND SOUTHERN INDIA MILLS ASSOCIATIONS**

#### KEY SPEAKERS



Shri Darsika Prasad  
Honorary Chairman,  
Andhra Pradesh Textile Mills  
Association (APTMA)  
Managing Director, M/s. Jankarwaper  
Textiles Pvt. Ltd.



Shri S. Jagadeesh Chandrah  
Vice President,  
The South India Spinnings  
Association (SISA)



Shri T. Rajkumar  
Chairman  
Confederation of Indian  
Textile Industry (CITI)



Dr. K. Sathyanuj  
Secretary General,  
Southern India Mills  
Association (SIMA)



Dr. Swapna Mishra  
Director (C&T), TSC



Dr. Vijay Yadav  
Director (Operations), TSC

DATE: TUESDAY, 11TH MAY 2021 | TIME: 11:30 AM INDIA

## ***Seminar on Training and Skilling: A Win-Win Strategy for Employer and Employee on 7th May, 2021 at 5 pm***

Texprocil and Textile Sector Skill Council (TSC) jointly organized a virtual Seminar on 'Training and Skilling: A Win-Win Strategy for Employer and Employee' on 7th May 2021 at 5 pm. Shri T. Rajkumar, Chairman, CITI addressed the Virtual Seminar and interacted with the participants.

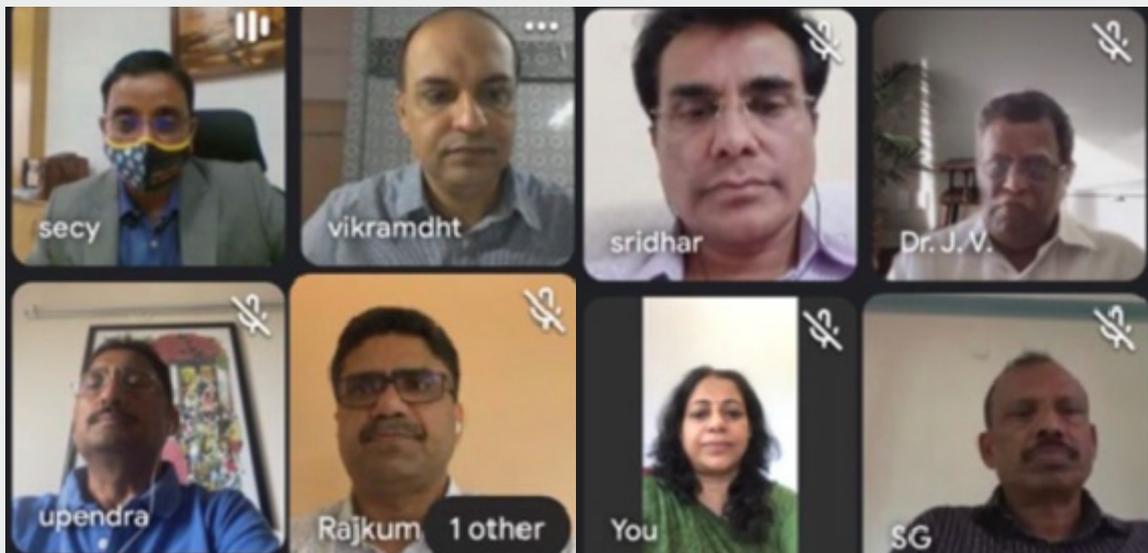


## ***CITI's Interactive Meeting with Department of Handlooms and Textiles, Govt of Karnataka on 26th May 2021 through Video Conference***

The Department of Handlooms and Textiles of the Government of Karnataka had an Interactive Meeting with CITI Chairman, Mr. T. Rajkumar and Representatives from TSC, SIMA, and CITI on the Impact of the Covid-19 pandemic on the Textiles Sector and about the possible intervention of the Government of Karnataka in the State at this crucial hour on 26th May 2021 through video conferencing.

Mr. Pankaj Kumar Pandey IAS, Secretary, Government of Karnataka, Mr. Upendra Pratap Singh IFS, Commissioner of Textiles and Handlooms and other officials of Government of Karnataka, CITI Chairman, Shri T Rajkumar, TSC CEO, Dr. J. V. Rao, SIMA Secretary-General, Dr. K. Selvaraju, and CITI Secretary-General, Dr. S. Sunanda, attended this meeting.

At the outset, CITI Chairman, Shri T. Rajkumar briefed about the impact of Covid-19 on the Textile Industry. Mr. T. Rajkumar said while the pandemic has created certain challenges in the country and for the Textile Sector, he was hopeful that the situation would improve in the coming days. CITI Chairman further expressed that Karnataka has immense potential to grow in the Textile Sector and assured his all possible support to work with the Government of Karnataka for the sectoral growth.



***CITI Chairman and Former Chairman, SIMA, Mr T Rajkumar attending Tamil Nadu Chief Minister's Virtual meeting on behalf of SIMA***



***CITI organized a virtual interactive Session with Mr. Navin Kumar Todi, Director, Lux Industries Limited (Lux Innerwear Brand)***



THE COTTON TEXTILES EXPORT PROMOTION COUNCIL



CONFEDERATION OF INDIAN TEXTILE INDUSTRY  
www.citi1986a.org

**“SUCCESS STORY OF LUX BRAND AND FUTURE PROSPECTS OF INNERWEAR BUSINESS IN INDIA”**

Interactive Session with  
**MR. NAVIN KUMAR TODI, DIRECTOR, LUX INDUSTRIES LTD. (LUX INNERWEAR BRAND)**

EMINENT SPEAKERS



Mr. Manoj Kumar Patodia  
Chairman, Texprocil



Mr. T. Rajkumar  
Chairman, CITI



Mr. Navin Kumar Todi  
Director, Lux Industries Ltd.



Mr. Ashwin Chandran  
Chairman, SIMA

DATE: WEDNESDAY, 26TH MAY 2021 | TIME: 05:00 PM INDIA

# CITI ANALYSIS OF EXPORTS OF T&A FOR MAY 2021

- India's textile and clothing exports were up by **40.03%** from US\$ **2405.52** mn. in March 2020 to US\$ **3368.44** mn. in March 2021. All commodity exports of India were up by **60.29%** in March 2021 over the same month of previous year. Whereas, the share of textile and clothing in India's total exports were down by **1.51%** in March 2021 on YoY basis.
- During March 2021, the exports of T&A following subsectors that have registered positive growth as compared March 2020:
  - Carpets by **+89.84%**
  - Jute Mfg. including Floor Covering by **+105.26%**
  - Handicrafts excl. handmade carpet by **+43.24%**
  - Cotton Yarn/fabric/made-ups, Handloom Products etc by **+55.67%**
  - Apparel by **+27.51%**
  - Man-made Yarn/fabric/made-ups etc. by **-31.37%**

## Monthly Export Updates of Textile and Clothing (Value in USD Mn.)

Export category	May-20	May-21	% Change	Cumulative (Apr'19-May'20)	Cumulative (Apr'20-May'21)	% Change
<i>Cotton Yarn/Fabs./made-ups, Handloom Products etc.</i>	464.88	1,106.10	137.93%	612.99	2,169.92	253.99%
<i>Man-made Yarn/Fabs./made-ups etc.</i>	166.84	411.00	146.34%	228.60	835.30	265.40%
<i>Jute Mfg. including Floor Covering</i>	9.93	35.38	256.29%	12.01	72.50	503.66%
<i>Carpet</i>	66.85	138.95	107.85%	75.79	268.82	254.69%
<i>Handicrafts excl. handmade carpet</i>	49.88	146.10	192.90%	61.41	304.69	396.16%
<b>Sub-Total Textiles</b>	<b>758.38</b>	<b>1,837.53</b>	<b>142.30%</b>	<b>990.80</b>	<b>3,651.23</b>	<b>268.51%</b>
<b>Apparel</b>	<b>516.63</b>	<b>1,106.69</b>	<b>114.21%</b>	<b>642.94</b>	<b>2,404.00</b>	<b>273.91%</b>
<b>Textile and Clothing</b>	<b>1,275.01</b>	<b>2,944.22</b>	<b>130.92%</b>	<b>1,633.74</b>	<b>6,055.23</b>	<b>270.64%</b>
<b>All Commodity</b>	<b>19,054.48</b>	<b>32,268.81</b>	<b>69.35%</b>	<b>29,410.60</b>	<b>62,893.90</b>	<b>113.85%</b>
<b>% of T&amp;C in Total Exports</b>	<b>6.69%</b>	<b>9.12%</b>		<b>5.55%</b>	<b>9.63%</b>	

Source: Press Information Bureau

# QUICK ESTIMATES OF IIP FOR TEXTILE AND CLOTHING SECTOR (T&C): APRIL 2021



## T&C in Index of Industrial Production (IIP): Growth Rates (% , Y-o-Y)

Sector	Weights	Index			Cumulative Index		
		April-20	April-21	% Change	Apr'19-Mar'20	Apr'20-Mar'21	% Change
Textiles	3.2913	11.0	113.2	#	115.7	90.7	-16.6
Wearing apparel	1.3225	9.7	136.1	#	154.6	108.6	-21.6
T&C Sector*	#	#	#	#	#	#	#

Source: \*CITI Analysis & Ministry of Statistics Planning & Implementation;  
# It would be inappropriate to compute T&C sector IIP data owing to Covid scenario

- For the month of April 2021, the Quick Estimates of Index of Industrial Production (IIP) with base 2011-12 stands at **126.6**.
- Cumulative change for April 2020- Mar 2021 for textiles was down by (-) **16.6** percent and Wearing Apparel was down by (-) **21.6** percent over the same period previous year.

# TEXTILE SECTOR SKILL COUNCIL



Indian Textile Industry provides revenue which is 27% of the total foreign exchange, mainly through textile exports. It contributes nearly 14% of the total industrial production of the country. Indian textile industry is also the largest in the country in terms of employment generation and currently generates employment to more than 35 million people.

To remain competitive in the open market, it is essential that the industry gets skill labor. Govt has taken strong initiatives to support skilling of workforce.

## STRATEGIC HIGHLIGHTS

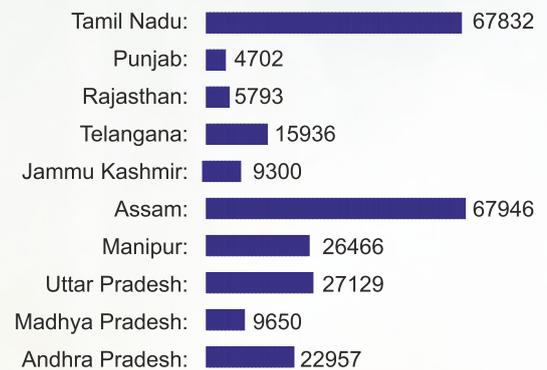
Affiliated 279 training partners. Out of these 195 are from organized mill sectors and 84 are from unorganized sector. To enhance spread of training over number of job roles, qualification packs were developed for 90 job roles.

58 Workshops were organized across India and including North-East.

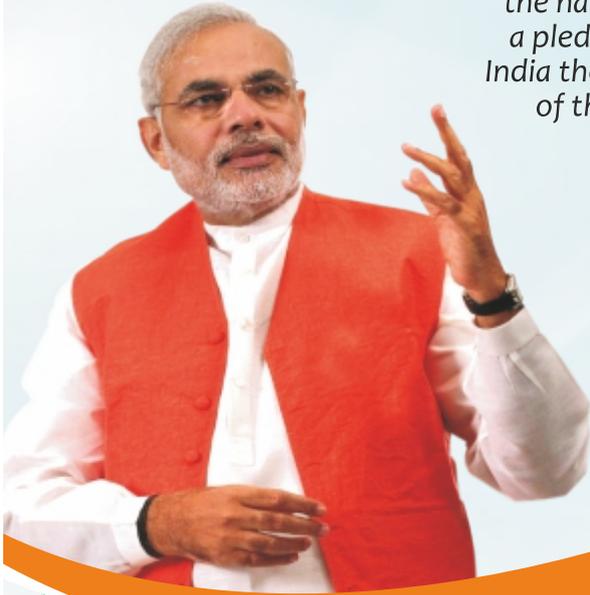
TSC has a strong presence on social media and is now able to connect with remote areas of the country.



## Region wise Enrolment :



“ I call upon the nation to take a pledge to make India the Skill Capital of the World.”



## TSC's ACHIEVEMENTS

Schemes: PMKVY, APSSDC, NBCFDC, NSFDC, NSKFDC & NCSR



Textile Sector Skill Council (TSC) is a not-for-profit Section 8(1) company established in August 2014 by 17 industry associations and 3 export promotion councils.

Continuously guided and monitored by more than 80 stakeholders representing all sub-sectors of the industry - organized textile mills and MSMEs.

### TSC has ...

- ✓ developed a full-fledged skill ecosystem to meet the skill needs of more than 80% of workforce employed both in organized mill sector, as well as, small and medium units of decentralized sectors which include handlooms, power looms and dyeing & printing units.
- ✓ established 430+ training centers all across the country which are operated by 1,350+ certified trainers.
- ✓ developed 90 QPs. Out of these 67 QPs were offered to train more than 56,000 fresh candidates and 2,20,000 RPL candidates across 19 states including NE and J&K.
- ✓ enabled 80% of certified candidates to be employed by industry with salary ranging between Rs. 8,000 and 14,000 (CTC).
- ✓ facilitated 250 RPL certified handloom weavers in availing Pradhan Mantri Mudra Loan to become entrepreneurs.
- ✓ connected 160 certified handloom weavers to buyers from foreign countries.



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## TEXTILE SECTOR SKILL COUNCIL

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