

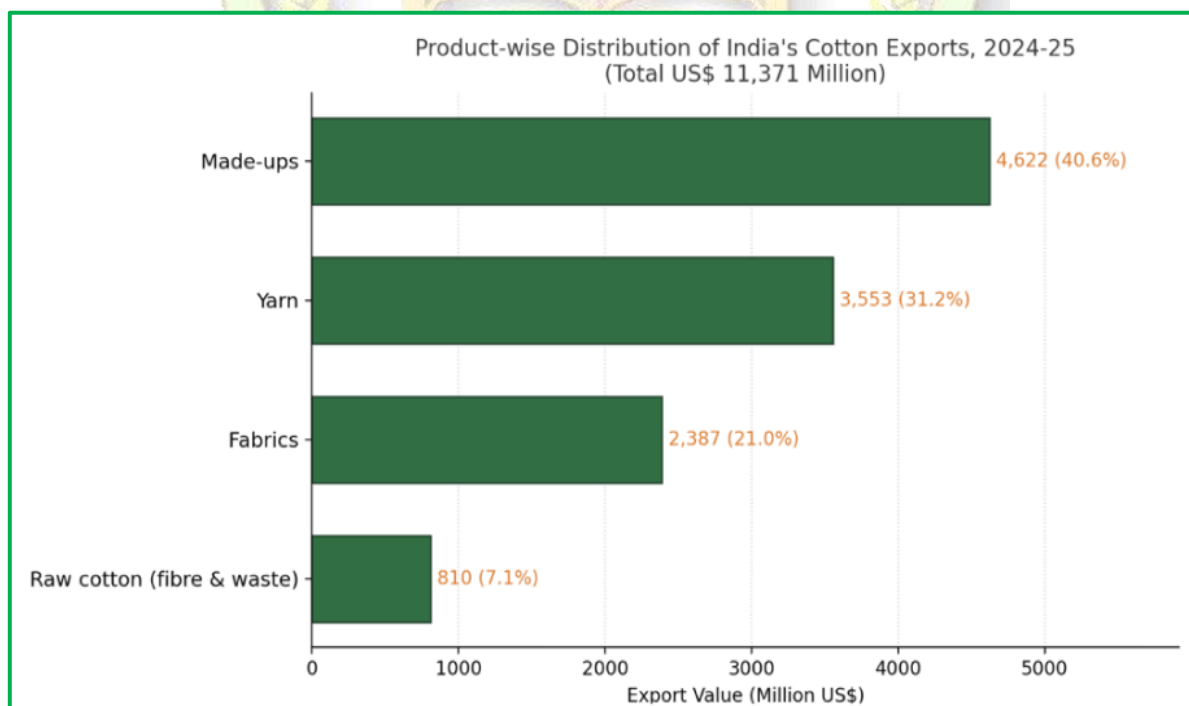
An Economic Analysis of India's Cotton-Textile Value Chain Under the 5F Vision

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Standing at the edge of a rainfed cotton cultivation region in Vidarbha, Telangana or Gujarat in the month of October, you are standing at the beginning of the chain of one of the longest value chains in India. The white bolls that open in the sunlight are going to be shipped from here to a ginning factory, then packed into bales and made into yarn in Tamil Nadu mills and woven into cloth in Surat or Tirupur and stitched into garments and finally hung up in a retail store in Hamburg, New York or Dubai. On that journey, the cost of production for one kg of cotton, which would probably not exceed a few hundred rupees, gets converted into garments that cost many times more. And the man who produced this cotton usually earns the smallest share of the margins. While India is the biggest producer of cotton in terms of area, the second-largest producer in terms of quantity and the top-three exporter of textiles and apparel, its average cotton output falls far behind the global average and its market share in the global textile industry is around 4 percent. This is the context within which the Government of India has set out the “5Fs” Vision: Farm to Fibre to Factory to Fashion to Foreign, a holistic strategy that views the cotton-textile industry not as five separate industries but as one long chain, where the failure of any single component has adverse effects on all others. In this article, we explore the economics of that chain – creation of value, leakage of value, problems being addressed by the 5F Vision, and how to achieve it.



Source: DGCIS (Ministry of Commerce), as published by TEXPROCIL.

Against this context comes the formulation of 5F Vision by the Government of India, which is a holistic view of Farm to Fibre to Factory to Fashion to Foreign, as an integrated approach that sees cotton textiles as not five individual industries, but one continuous process, where inefficiency in one process will negatively affect the other processes. In this article, the economics of the process will be described; that is, how value is being generated, how value is being lost, and the problems addressed by 5F Vision.

The 5F Vision: What Does It Actually Mean

The 5F concept was laid out by the Prime Minister of India in 2021 and has since been re-stated on various national platforms of textiles such as Bharat Tex. It's pretty straightforward in nature. In the past, there has always been a lack of cohesiveness when it comes to the textile industry in India as seed cotton went to traders from farmers, then lint to spinners from ginners, and finally yarn to weavers and garments to exporters at whatever rate the buyer had quoted. But the 5F concept attempts to bridge that gap:

1. **Farm:** Better seed, higher productivity, assured prices and quality raw cotton.
2. **Fibre:** Clean ginning, grading and traceable lint, along with growth in man-made fibres (MMF) alongside natural fibres.
3. **Factory:** Modern spinning, weaving, processing and garmenting units, ideally clustered in integrated parks.
4. **Fashion:** Design, branding, technical textiles and higher value-added products rather than commodity basics.
5. **Foreign:** Market access, trade agreements and a bigger share of global textile and apparel exports.

The goal of the government is to increase the size of the industry's market to reach the level of \$350 billion and the exports to hit the mark of \$100 billion. It must be noted that the current level of textile and apparel exports lies between \$35-38 billion per year, which means that the target requires more than doubling of exports in just a few years' time. This is quite a difficult task and will be clear from the following economic analysis.

Why Cotton-Textiles Matter to the Indian Economy

The textiles and garments industry makes up approximately 2 to 2.5 percent of GDP of India, around 13 percent of its industrial production, and is a significant contributor to the exports of goods. But the sector's more important role is that it is one of the biggest employers in India after agriculture, employing an estimated 45 million people and many others indirectly. Women form a large proportion of the labour employed, along with rural labourers. The sector employs about six million cultivators only in the area of cotton, and the whole cotton business chain employs many millions of people. No other sector has this kind of rural presence, labour intensity and export capability. That is why this sector has a very political and economic significance because any change in cotton prices, cost inputs and export duties will affect the whole sector.

Current Status: Where India Stands in the Cotton World

Cotton cultivation in India takes place on about 11-13 million hectares, which means one-third or more of global cotton cultivation area, the highest among all the nations of the world. The total cotton production was usually between 30 and 35 million bales, with each weighing 170 kg (about 5.2-6 million tonnes of lint), which meant that India ranked just below China in terms of production and above the USA and Brazil in certain years. However, area and production reveal two sides of a coin. India's average lint yield is about 430-480 kg per hectare, while the world average is significantly higher than 700 kg per hectare and is much higher (above 1500 kg per hectare) in such countries as China, Australia, and Brazil. The explanations for this situation are very clear. Around two-thirds of Indian cotton is produced in rain-fed areas, farmers own small landholdings, the current Bt hybrids are less effective against pink bollworm, and planting density is low when compared to planting density in other countries. At the same time, Indian cotton is often criticized because of its contamination, hybrid nature

and poor grading. On the other hand, India is known to have one of the biggest spinning facilities around the world and has an all-encompassing structure from yarn to finished garments, which is something very difficult to find in any other country. However, its export figures in terms of garments are less than that of China, and in the recent years, Bangladesh and Vietnam have been progressing faster.

Mapping the Value Chain: Who Earns What

The economic logic of the 5F Vision becomes clear when we follow one unit of cotton through the chain. The figures below are indicative and vary by year, grade and market, but the pattern is consistent.

- **Farm gate:** The cotton farmer sells his/her produce, i.e. seed cotton (kapas), either at or near the Minimum Support Price (MSP) or the prevailing market price. For 2024-25, the MSP for medium staple cotton was ₹7,121 per quintal and for long staple ₹7,521 per quintal. These have been increased for 2025-26 (to ₹7,710 and ₹8,110 per quintal respectively). After deducting the cost of seeds, fertilizer, pesticides, labour cost for harvesting and irrigation, the net profit for a small farmer is small and quite sensitive to output level.
- **Ginning and pressing:** Seed cotton is transformed into lint (a third of the weight) and cottonseed. By-products in the form of cottonseed, its oil, and cakes have significant importance, and the economics of ginning is largely dependent upon the price realization from the same as well as lint.
- **Spinning:** Lint turns into yarn. This sector is capital-intensive and very price-sensitive because of high price sensitivity of raw cotton (it forms more than half of yarn cost).
- **Weaving, knitting and processing:** Yarn is turned into grey cloth, which is subsequently dyed, printed and finished. There is much value creation at this step, but also significant impact on the environment through water use and effluents.
- **Garmenting:** The cloth is cut and sewn to make garments. This is the most labour-intensive step and the step with greatest value creation.
- **Brands and retail:** The final selling price to the consumer includes the value added through design, brands, logistics and retail operations.

For example, one kg of cotton lint, which is worth about ₹150-200, may eventually be turned into clothing that is worth ₹1,000-₹2,000 or even higher. Multiplication occurs through fabric, processing, designing, and branding, not through farming. The fundamental economic point is that a nation that exports yarn and fabric will realize a relatively small portion of the ultimate value while the nation that exports designed clothing will earn much more. The 5F Vision is fundamentally an attempt to climb this value chain.

Economics at the Farm Gate: The Weakest Link

Whereas a chain is only as strong as its weakest link, so also is the farm where the pressure is highest. The cultivation of cotton is a very costly affair. Seed, pesticides, fertilizer, and particularly the cost of harvest labour have been extremely burdensome for the cost of cultivation; in case of poor yields, the cost per quintal becomes very high. With the yield levels of 400-450 kg lint per hectare, the farmer may just about break even at favourable prices in the market; but poor yields due to insect infestation or bad monsoon cause losses. Three problems in terms of structure have emerged. Firstly, the problems of pests and variety fatigue; following the adoption of Bt cotton extensively from 2002, the yields increased considerably for the first decade, but now the yield increase has slowed down and the resistance of pink bollworm has re-emerged in many regions. Secondly, low density planting and dependency on hybrids; Indian farmers plant with wide spacing using costly hybrid seed while a more compact high density planting system can help improve yield and also result in less spraying. Lastly, the market signals of price and quality never reach the farmer; majority of farmers sell mixed and unsorted seed cotton. Action is being taken in the policy arena as well. The Government's promise of a Mission for Cotton Productivity for five years in the budget for 2025-26 is for the promotion of extra-long staple cotton with improved adoption of seeds and technology. The Kasturi Cotton Bharat initiative backed by the Ministry of Textiles along with industry

associations is an attempt to introduce traceability and branding of Indian cotton, which will hopefully get its proper due value and price. The Cotton Corporation of India is still engaged in conducting MSP operations whenever market prices fall.

Fibre and Factory: Scale, Technology and the Cotton-MMF Question

Competitiveness post-farm, on the other hand, hinges on cost, technology, and scale. The spinners of India are significant on the global stage. However, prices for cotton are a constraint to margin since cotton prices, sometimes higher than the international prices in some seasons, make things difficult during low demand for yarn. In addition, the local cotton has had to compete with the import of cotton at a duty of 11 percent. This is duty that has been suspended temporarily in some periods in order to cushion industries against a shortage of raw materials. The Government has launched several schemes to address this:

- **Mega Integrated Textile Region and Apparel (PM MITRA) Parks:** These seven mega parks in Tamil Nadu, Telangana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Uttar Pradesh will be established at a cost of ₹4,445 crore. It will help integrate spinning, weaving, processing, garmenting and logistics under one roof so as to reduce transport cost and achieve economies of scale to compete with Bangladesh, Vietnam and China.
- **Production Linked Incentive (PLI) Scheme for Textiles:** It is a scheme for investing in man-made fibre apparels, fabrics, and technical textiles in which India is weak and its investment cost is ₹10,683 crore.
- **National Technical Textiles Mission:** This mission is for development of research, standards and marketing of technical textiles like medical textiles, geotextiles and protective clothing.
- **Amended Technology Upgradation Fund Scheme (ATUFS):** It is a credit-linked scheme to upgrade the machines.

This common thread runs across the board: is it time for India to place greater emphasis on man-made fibres? Across the world, MMFs form the greater portion of fibre usage, whereas India continues to be cotton-dominated. Cotton is what India has, but markets overseas are demanding blends and man-made fibres. A balanced strategy seems more prudent – improving the former while developing the latter.

Fashion: Moving from Volume to Value

'The Fashion Link' would be the place where the 5F Vision becomes the most visionary. At present, the bulk of India's exports are cotton yarn, made-ups, and apparel designed to supply foreign companies. These are indispensable but unprofitable. The shift towards design, branding, and technical products can increase profit earned from each kilogram of fiber many times over. India offers its natural strengths: a long tradition of handlooms and handicrafts, diversity of regional fabrics, an enormous pool of skills and domestic market demand. Organic and eco-friendly cotton, handloom fabrics, and 'Made in India' labels become increasingly popular in the markets of environment-friendly consumers overseas. Technical textiles for the sectors of health care, automotive industry, building, agriculture, and defense are yet another highly prospective area with India's share being relatively small compared with the country's capabilities. However, value addition would require investments in design schools, testing laboratories, certifications, branding and marketing online – areas in which small Indian firms have fallen behind. Skilling is equally essential, because garmenting as well as processing requires skilled manpower that can meet international standards of quality.

Foreign: Trade, Tariffs and Global Competition

This last F has the least protection against forces that are beyond the control of India. The participation rate of India in world trade of textiles and apparels is roughly 4 percent, which is low compared to that of China. India's competitors, such as Bangladesh and Vietnam, have access to Europe and other markets with the help of preferential access to the European Union and huge factories dedicated to exports. The gap has been narrowed down by India by free trade policies, such as its recently concluded free trade agreement with the UK and EFTA bloc.

On the other hand, the industry is beginning to realize just how susceptible it is to global disruptions. The application of high additional duties by the U.S. government in 2025, which is an important market for Indian home textiles and clothing, put pressure on exporters in clusters with a predominance of cotton-based operations, including Tirupur, Surat and Panipat. This situation brought into light the danger of relying solely on one market. In order to survive in the future, diversification into markets like EU, UK, Japan, the Middle East and many others is absolutely essential.

An Economic Reading: Where Does the Chain Leak?

Putting the puzzle pieces together, a few economic lessons emerge:

1. Productivity gap at the base. Increasing the yield of cotton by even 25-30 percent will lower the cost per kilogram, increase revenue and strengthen the supply base for the entire chain. Very few interventions in the value chain can multiply in effect like this one.
2. Premium missing. Absence of grading, traceability and clean picking means that the premium for quality fibre will not be collected by the farmers.
3. Policy trade-offs. The MSP, import duty and export policies impact different segments of the chain in opposite directions. Clear and predictable policy is the biggest consideration than any individual intervention.
4. Scale economies and clustering. Integrated parks and advanced machinery can reduce logistics and energy cost and create competitiveness in the Indian factories.
5. Value addition. The more value that India adds (moving from yarn and fabrics to clothes, technical textile and brands), the more money it makes.
6. Concentration of markets. Dependence on a few export markets leaves the exporters susceptible to tariffs.

Recommendations

1. For the growers: Adopt good variety and spacing, integrated pest management, fertiliser application according to soil test results, select good cotton and do not mix grades to get premium due to good quality.
2. For farmer group: Organise FPOs to pool their produce and obtain better prices, gain access to ginning and storage facilities and directly connect with the mills and traceability systems.
3. For the industry: Modernize, scale up and cluster; make use of PM MITRA parks and PLI schemes; and develop capacity in cotton and manmade fibre segments.
4. For the policymakers: Send consistent signals regarding MSP, import duty structure and trade policies; improve cotton research on yield and pest management; and enhance facilities for quality grading and testing.
5. For the exporters: Look for diversification of markets; invest in design and branding; and be ready to meet sustainability and traceability requirements.
6. For institutions: Improve skilling; provide credit facilities to small units; and extension services connecting the farmers with market and technological information.

Conclusion

The cotton textile industry in India is one of the rare examples in the economy where a choice made by a farmer in June could be linked to the choice made by the buyer in December, but on a distant continent. The 5F Vision appreciates this link and rightly believes that this chain should be managed as one system. The economic analysis reveals that what is holding back the biggest strengths of the chain, namely its size, integrated manufacturing base, and skilled labor force, is perhaps its biggest weakness, which is low agricultural productivity and poor quality signalling on the bottom end of the chain. The other end of the chain, which promises big returns through design, technical textiles, and branded exports, remains a largely untapped area for India. The measures like establishment of PM MITRA parks, production-linked incentives (PLIs), the mission for cotton productivity and new trade policies are crucial; but the effectiveness of these measures would depend on their implementation, stable and consistent policy and, most importantly, distribution of benefits to the farmer and the labour, not just to

the factory owners. When productivity is increased at farms, when processing of the fibre is improved, when the fashion is distinctive and when exports are diverse, the 5F vision would become a reality through numbers rather than a mere slogan. What is needed now is a simple task to perform: to make each boll count.

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