

# Transformations In Cotton Production In Independent India

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## **Abstract:**

**Background:** Cotton cultivation in India often fluctuates from season to season owing to unfavorable weather conditions, drought and/or flood like conditions, inadequate irrigation facilities, illiteracy in farming community, soil erosion, improper manuring and low application of fertilizers, non-mechanized and outdated farm implements, lack of capital and insufficient credit facilities, lack of proper marketing system. Therefore, the productivity in Indian agriculture is moving on a slow path of development as compared to China. The objectives of this paper are to study the changing tendencies in Indian cotton performance and to emphasize the reasons behind the ebb and flows in production, acreage, and productivity.

**Methods:** The data on cotton area, production and yield derived from the website of CCI in a tabular form and a concise analysis moderately worked out with supportive reasons for cotton performance in India since independence.

**Results:** Despite a setback of large area under cotton left for Pakistan during the partition, independent India reported a meagre 3.3 million bales of cotton produced in 4.42 million hectares with an average yield of 132 kg lint/ha in 1947-48. India has achieved twelve-fold improvement in cotton production, three-fold development in acreage, and five-fold enhancement in productivity during the past seven and half decades. In addition to the implementation of timely schemes by the government, the Technology Mission on Cotton needs to focus attention on encouraging farmers to produce better quality cotton by using sophisticated technologies. Besides, the government should set-up a marketing system that enable growers to realize remunerative prices and adequate credit facilities.

**Conclusion:** From a modest beginning in 1947-48, the cotton sector has achieved substantial growth in production, acreage, and productivity. However, to sustain and further enhance this progress, it is crucial to address issues such as outdated farming practices, insufficient credit facilities, and the need for a more effective marketing system, etc.

**Key Word:** Cotton area; Cotton cultivation; Cotton production; Productivity; Yield.

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## **I. Introduction**

Cotton is the most important natural fibre that claims 40 percent of world's total fibre production. It serves an industrial activity, provides employment, and earns foreign exchange. Cotton is a raw material for seven million power looms, four million handlooms, and 1500 processing mills in India. It is a livelihood for sixty million people who engaged in production, trade, processing, and textiles. The export contribution of textiles including cotton is about 23 percent. Textile sector provides a significant support to the Indian economy. Nanda Kumar and Singh (2009) stated that the cotton provides 4 percent GDP, 20 percent work force, 14 percent industrial output, 12 percent global textile fabrication, 17 percent export revenue that accounts for about eighty thousand crore per annum, employment to about thirty million people, and consumes 70 percent domestic production. Thanks to the continued concerted efforts taken by the government right from the introduction of 'Grow More Cotton' program in 1950 (Agarwal, 2007). Owing to focused endeavors adopted by the government under the aegis of Indian Central Cotton Committee, Bombay the cotton area has been expanded to 7.8 million ha with an intensified production of 5.3 million bales (170 kg each bale) by 1966-67.

The main cotton producing countries in Asia are China, India, Pakistan, Uzbekistan, Kazakhstan, etc. In India, Gujarat and Maharashtra are the leading cotton producing states followed by Telangana, Andhra Pradesh, Madhya Pradesh, Punjab, Haryana, Rajasthan, Karnataka, and Tamil Nadu. Punjab and Haryana have emerged as the leading producers of long staple cotton for which there is great demand. Cotton cultivated in both the Kharif and Rabi seasons both as an irrigated and un-irrigated crop. Cotton encompasses about 7 percent of the total acreage in Kharif next only to rice.

## II. Cotton Performance In Independent India

The data pertaining to total area under cotton cultivation, production, and yield per hectare in India from 1947-48 to 2021-22 presented in Table 1.

**Table no 1:** Area, production, and productivity of cotton in India from 1947-48 to 2021-22.

Year	Area		Production		Yield	
	In lakh hectares	In lakh bales of 170 kg	In lakh bales of 170 kg	Kg per hectare		
1947-48	44.24		33.36		132	
1950-51	58.82		34.30		99	
1960-61	76.10		60.12		134	
1970-71	76.05		56.64		127	
1980-81	78.23		78.00		169	
1990-91	74.39		117.00		267	
2000-01	85.76		140.00		278	
2001-02	87.30		158.00		308	
2002-03	76.67		136.00		302	
2003-04	76.30		179.00		399	
2004-05	87.86		243.00		470	
2005-06	86.77		241.00		472	
2006-07	91.44		280.00		521	
2007-08	94.14		307.00		554	
2008-09	94.06		290.00		524	
2009-10	103.10		305.00		503	
2010-11	111.42		339.00		517	
2011-12	121.78		367.00		512	
2012-13	119.78		370.00		525	
2013-14	119.60		398.00		566	
2014-15	128.46		386.00		513	
2015-16	122.92		332.00		459	
2016-17	108.26		345.00		542	
2017-18	125.86		370.00		500	
2018-19	126.14		333.00		449	
2019-20	134.77		365.00		460	
2020-21*(P)	130.07		353.84		462	
2021-22*(P)	120.69		362.18		510	

\*Source: Meeting of Committee on Cotton Production and Consumption (COCP) held on 12.11.2021; P-Provisional

## III. Discussion

It was quite evident that British empire encouraged commercial crops in India, especially cotton. Britain was the largest importer for Indian cotton cloth during 1950s, and 60s. India has produced short staple (below 20.6 mm), medium staple (20.6 mm to 25.4 mm), and medium long length (26.2 mm to 27.8 mm) cotton varieties up to 1970s. Long staple (28.6 mm to 33.3 mm) and extra-long staple (ELS) (above 34.9 mm) cottons were imported (Sobuj, 2016). India has started developing hybrid cottons in 1970 and four new cotton species revamped the situation of cotton production and acreage in 1980s viz., *Gossypium arboreum*, *Gossypium herbaceum*, *Gossypium barbadense*, and *Gossypium hirsutum*. During 1990s adequate quantity of cotton produced domestically with these four hybrid varieties. Consequently, two-fold development in cotton planting area as well as yield per hectare and five-fold progress in production was achieved by 2000 since independence.

Cotton Advisory Board (CAB), associated with production and consumption of cotton, has projected cotton production in 2001-02 at 15.8 million bales. This estimate done based on the arrivals received from all cotton producing states of South Zone and Gujarat and corroborated by the East India Cotton Association (EICA). Maharashtra and Gujarat made distinction of being the highest cotton producing states in the country. Cotton production in Madhya Pradesh has reported higher side considering the comparatively smaller area (6.23 lakh hectares) under cotton cultivation as well as the movement of cotton from other states into the state of Madhya Pradesh. The yield per hectare has increased to 308 kg from 278 kg in the previous year.

The cotton crop in 2002-03 was optimistic due to good initial rains in the country. But weather turned unfavorable once the season had advanced. There were inadequate rains in all the cotton growing states in the country. Droughts like conditions were prevailed in the month of July which considered as the wettest month of the monsoon season. Therefore, cotton planting area has narrowed down to 76.67 lakh ha registering a reduction of about 14 percent from the previous year. The fall in acreage has occurred in all cotton states. However, cotton states in Southern and Central Zones charged bigger toll. Karnataka suffered the most with a fall of 2.3 lakh ha followed by Gujarat 1.9 lakh ha and Maharashtra 1.8 lakh ha. The CAB has initially furnished production estimates at 158 lakh bales then reduced to 140 lakh bales and further revised to 136 lakh bales. This final estimate approved by the EICA. As explained, the reason behind the decline in production was the fall in the

sowing area owing to inadequate rains, there was, however, a positive aspect. Productivity marginally reduced to 302 kg lint/ha from 308 kg lint/ha in the previous year. Damages from pests and diseases lowered due to hot weather conditions which prevailed during a major part of the season.

The cotton season (October – September) 2003-04 has proved to be beneficial to farmers as well as trade and industry. Despite a large crop, prices did not go below the support level and remained remunerative to the farmers. The government policy of free import and export of cotton has facilitated the industry. On the one hand industry can import cotton as per qualitative requirement and on the other hand it can export cotton which not needed by the indigenous industry. The Textile Commissioner, Government of India has estimated cotton production at 175 lakh bales while the CAB estimated at 167.50 lakh bales for 2003-04. Based on subsequent feedback from the trade and on the arrivals, the production estimated finally by CAB at 179 lakh bales from the area equal to the previous year. There was a significant raise in yield per hectare by stirring to 399 kg, up 32 percent from the past year.

A historic raise in both cotton production and productivity recorded in the year 2004-05. The cotton production registered at 243 lakh bales, clocking a rise of more than 35 percent from the previous year, while the productivity reported at a record level of 470 kg per hectare, about 18 percent improvement from the previous year. The contributory factors for this progress were overall favorable weather conditions, remunerative prices received by the farmers in the previous year which incentivized them to plant more area under cotton, sizable increase in area under hybrids and Bt cotton, adoption of modern technology on large scale due to implementation of various cotton improvement programs by the government and the private sector agencies, adequate water supply through canals, and some increase in the area under irrigation in Gujarat. It was during this year that the average yield in four states viz., Punjab, Rajasthan, Gujarat, and Tamil Nadu crossed 500 kg. The state of Rajasthan stood out with average yields 720 kg that was almost equal to the productivity of the leading cotton producing countries in the world. India's production record of twenty-four million bales has surpassed the decadal average production of USA, i.e., 17.9 million bales. In a report published by the United States, Department of Agriculture, stated that if India continues to maintain same level of output it would become second largest cotton producer after China.

Cotton highlighted a marginal fall two lakh bales in 2005-06 from the previous year along with shrinkage in cultivated acreage to 86.77 lakh ha from 89.70 lakh ha. The CAB has initially estimated the production at about 244 lakh bales and later revised it to as high as 250-255 lakh bales and subsequently brought down to 241 lakh bales due to unexpected heavy unseasonal rains in the months of October and November and incidence of diseases like wilt which hit cotton growing areas. Gujarat has maintained its status quo as top ranker amongst all the cotton producing states with a record production eighty-nine lakh bales or about 36 percent of the total production in the country. However, a marginal increase in productivity to 472 kg from 470 kg in the past year was a matter of appreciation. Gujarat recorded the highest average productivity of 728 kg followed by Tamil Nadu with a unit yield of 687 kg lint/ha.

Cotton year 2006-07 has registered 16 percent growth in production to 280 lakh bales, 5 percent improvement in cultivated area to 91.44 lakh ha, and 10 percent enhancement in productivity to 521 kg lint/ha as compared to the previous year. Factors such as good monsoons, higher plantation of Bt cottons on account of fresh approval of government for twenty new Bt cotton varieties for commercial cultivation and domestic ELS variety DCH 32 because of high ruling prices for ELS cotton in the existing season, good yields, robust textile demand, and balanced supply-demand matrix encouraged farmers to grow crop in extended area (News, 2006). Gujarat recorded the highest yield of about 728 kg lint/ha.

For the third consecutive year, the cotton season 2007-08 demonstrated uninterrupted progress in production, area, and yield by 10 percent, 3 percent, and 6 percent, respectively. The Bt cotton cultivation rally stepped up in all cotton growing states. Out of the total area of 94.14 lakh ha, about 64.14 lakh ha i.e., about 68 percent sown under Bt cotton. According to the CAB, the average yield per ha in Gujarat, Andhra Pradesh, Punjab, and Tamil Nadu was the same as the global average of 650-750 kg lint/ha. As a result, by surpassing USA, India turns into second largest cotton producer next only to China.

The CAB has initially estimated cotton production during 2008-09 at 322 lakh bales later cut it down to 290 lakh bales. This lowering of estimates was on account of overall climatic conditions which were not as favorable as during the last year. Although the rains started early in the middle of June, there were no monsoon rains for 35 to 40 days between 15th June to 25th July 2008, especially in Central Zone. Resultantly, during this period, the cotton sowing delayed in Maharashtra, Gujarat, and Madhya Pradesh. There were excessive rains in parts of Andhra Pradesh and Saurashtra district of Gujarat. Deficient rains reported in later part of the season (September and October 2008) in Central and Southern Zones. The erratic rains affected the cotton crop resulting lower production. In May 2009, the Cotton Association of India (CAI) has slightly revised downwards the production estimate based on expected lower production in North and Central Zones and in other states. There was a marginal increase in production in South Zone. However, the softly downward revision of CAI's,

does not appear to have altered the CAB's earlier estimate of 290 lakh bales. The average yield per ha dropped by 5 percent from the previous year.

Cotton year 2009-10 has reached a new milestone in Indian cotton history by crossing 10 million ha hurdle of cotton area under cultivation. The total area sown under cotton increased by 10 percent to 10.3 million ha from the previous year. The rise in area observed in all states except the state of Madhya Pradesh. Despite unfavorable weather conditions cotton farmers expected higher remunerative prices during the year as like the previous year. Spread of Bt Cotton technology with assured higher yields was another contributory factor. Thus, the cotton production increased by 5 percent to 305 lakh bales. But the average yield per ha slashed by 4 percent.

The surge in cotton production continued for the second successive year as the price rally spurred and growers raised planting in all cotton states during 2010-11. Total cultivated area, production, and productivity increased by 8 percent to 111.42 lakh ha, 11 percent to 33.9 million bales, and 3 percent to 517 kg lint/ha respectively over the previous year. Despite crop damage cotton performance proved to be satisfactory during 2nd and 3rd flowering periods in Adilabad area in Andhra Pradesh, Khandesh, Vidarbha, and Marathwada areas in Maharashtra, and Saurashtra area in Gujarat. The unseasonal rains in the month of December 2010 and subsequent extreme cold wave in January 2011 impacted crop in Gujarat.

Cotton plantation during the season 2011-12 amplified by 9 percent to 121.78 lakh ha due to continued higher price rally. Normal monsoons throughout the cotton belt were an added advantage. As a result, cotton output augmented by 8 percent to 36.7 million bales. But yield marginally dropped by 1 percent to 512 kg lint/ha due to the crop hit by rough weather conditions, particularly in Andhra Pradesh and Maharashtra. Extended cotton farming in non-conventional areas was another cause for lesser produce. Higher price rally in the previous year, rupee depreciation, and remunerative overseas demand on account of world short supply attracted farmers in non-traditional areas who have less experience in cotton farming led decline in productivity (Pattanayak, 2011).

Despite lower estimates of production and marginal drop in acreage cotton year 2012-13 has promised a bumper output of thirty-seven million bales showing a marginal hike from the earlier year. Average yield per ha surged about 3 percent to 525 kg.

With 39.8 million bales of production and 566 kg of lint/ha the cotton season 2013-14 has pegged a new record in Indian cotton history. The contributory factors for this massive growth were favorable monsoons, less pest attacks, better usage of fertilizers and manuring, superior adoption of farm technology and management practices, cultivation of high yield varieties, and coverage of huge area under Bt cottons (CCI, 2021). The net area under cotton planting was as equal as the preceding year.

Cotton season 2014-15 has earmarked by more than 7 percent annual increase in cotton acreage to 128.46 lakh ha while production and productivity diminished by 3 percent and 9 percent, respectively. Water shortage, crop damage, and lower yields were major causes of concern.

A fair decline in cotton acreage, production, and productivity registered in 2015-16 due to adverse weather conditions, delayed sowing, and low-price realization (Nikesh, 2015). Cotton production stalled at 33.2 million bales, down 14 percent over the previous season. White fly attack in Punjab and Haryana and pink boll worm attack in Gujarat hampered the yield.

Despite crop damage in Gujarat due to floods cotton year 2016-17 has proved 4 percent growth in production over the past season. Good monsoons helped germination of cotton pods across the cotton belt. No pest attacks were another advantage (Kasabe, 2016). Besides, the net cotton acreage was plummeted by 12 percent to 108.26 lakh ha. Telangana and Andhra Pradesh governments advised cotton farmers for shifting to other crops led fall over acreage. However, net yield per ha increased by 18 percent to 542 kg over the preceding season.

Cotton crop in 2017-18 boosted by 7 percent to 37 million bales from the previous cotton season. This was on account of perceived higher yields received from Gujarat (Bhosale, 2018). Similarly, cultivated area increased by 16 percent to 12.58 million ha. But yield per ha decreased by about 8 percent from the previous year due to pest attacks.

Despite marginal increase in cultivated area cotton season 2018-19 has pegged 10 percent plunge in production and productivity over the past year. The major cause for shortfall in output was that the South Zone farmers were uprooted cotton plants owing to moisture deficiency. Hence, there was no possibility for third and fourth pickings (Bureau, 2019). A portion of crop damage perceived in Central Zone too during the year.

Cotton marketing year 2019-20 has witnessed an upward movement in all three components of area, production, and yield by 6.84 percent to 13.4 million ha, 9.6 percent to 36.5 million bales, and 2.44 percent to 460 kg lint/ha respectively over the previous year. All cotton zones have perceived superior performance across the cotton belt especially Central Zone. But Southern Zone has done well in growth-wise development (Dsouza, 2020).

The CAI has estimated drop in production in 2020-21 due to lower cotton performance in Central Zone especially Gujarat and Southern Zone especially Telangana (PTI, 2021). The projected production was down by 3 percent to 35.3 million bales from 36.5 million bales in the previous season. Continued global pandemic from the past season has adversely affected the cotton performance a bit.

The CAI has released fresh estimation of cotton production for the year 2021-22 with 34.8 million bales after a revision from earlier estimation of thirty-six million bales. The decline in estimation is on account of expected lower outputs from well performing states of Gujarat, Telangana, and Karnataka (Agencies, 2022).

**Problems in Cotton Cultivation:** Cotton cultivation in India often fluctuates from season to season owing to unfavorable weather conditions, drought and/or flood like conditions, inadequate irrigation facilities, illiteracy of farming community, soil erosion, improper manuring and low application of fertilizers, non-mechanized and outdated farm implements, lack of capital and insufficient credit facilities, and lack of proper marketing system. Therefore, the productivity in Indian agriculture is moving on a slow path of development as compared to China. Rising cost of production, unmanageable debts, stagnant yields, incessant use of pesticides, poor irrigation, absence of modern technology, manual picking, vulnerability to contamination, deterioration in genetic purity, competition from artificial fibres especially synthetic fibre, fluctuating market prices, and lack of participation of CCI are the problems faced by cotton farmers in India (Pah, 2014).

**Steps to Improve Productivity:** There is a huge untapped economic potential of the cotton in India. The soil and climatic conditions prevailing in the country are quite suitable for cotton production. The government has taken so many measures to improve cotton productivity in India. Some of them are Technology Mission on Cotton (TMC) (2000), National Textile Policy (2000), Technology Upgradation Fund Scheme (1990-2012), Draft National Fibre Policy, Minimum Support Price (MSP), instructions to CCI to procure cotton if the price falls below MSP, etc. In addition to the implementation of timely schemes by the government, the TMC needs to focus attention on encouraging farmers to produce better cotton by using sophisticated production technology, scaling down the cost per unit of production, reducing pesticide usage, and improving yield per hectare. Besides, the government on its part should provide adequate credit facilities and set-up a marketing system for cotton to enable growers to realize remunerative prices.

#### IV. Conclusion

For the last few years, growth rate of agriculture in India is a causing concern. However, cotton has proved to be an exception. Cotton production in India is consistently rising irrespective of good or not so good monsoons. The Indian villages have recorded yield as high as 965 kg lint/ha, about 33 percent higher over the global average of 759 kg lint/ha. As a result, a position reached where Indian cotton has become conspicuous in the leading global economies such as China and USA. India is now very much a part of world cotton trade, influencing the global scenario and cotton prices. India has achieved twelve-fold improvement in cotton production, three-fold development in acreage, and five-fold enhancement in productivity since independence. Rising cost of production, unmanageable debts, incessant use of pesticides, absence of modern technology, manual picking, competition from artificial fibres, and fluctuating market prices are the problems faced by cotton farmers in India. In addition to the implementation of timely schemes by the government, the TMC needs to focus attention on encouraging farmers to produce better cotton by using sophisticated production technology. If it so, India's share in world cotton production may reach to 25 percent in near future from the current 22 percent.

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