Research Article

Trends in Growth and Development of Cotton Cultivation in Karnataka: A Trend Analysis

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Abstract

This paper deals with the growth and development of cotton production in Karnataka. Cotton is one of the most important crops grown in India. India is the 4th ranked producer of cotton in the world. With a vast agro-ecological diversity, India is home to a range of crops including grains, pulses, oilseeds, vegetables, sugarcane, and soybeans, amongst others, which help in providing food and nutrition security and economic sustainability to its people (Economics Survey of Karnataka, 2024-25). Cotton, one of the foremost amongst these crops, has a strategic role in India's international agricultural sector. In Karnataka, cotton cultivation is one of the key agro-based industries and plays a significant role in agricultural and allied activities. The present study discusses the performance and growth and development of cotton production in India as well as Karnataka state. The time series data were collected for the period from 2008-09 to 2019-20. The present study results that the correlation between area and production of cotton cultivation in Karnataka. The calculated mean values of area and production are 151.9667 and 226.5075 respectively. The calculated standard deviation values of area and production are 36.41702 and 87.24934 respectively. The tested Pearson correlation value is .867. So, reject the null hypothesis. Hence, there is a positive correlation between area and production of cotton cultivation in Karnataka.

Keywords: Cotton Cultivation, Growth, Area, Production, and Yield.

1. Introduction

Agriculture continues to be the foundation of India's rural economy and social fabric. When it stagnates, the consequences are immediate and far-reaching—farmers are pushed into poverty, livelihoods are strained, and the broader economy suffers. As aptly observed by Keshava S. R. (2023), "the farmer who feeds the world remains hungry when agriculture is neglected." Without meaningful development in this sector, raising the standard of living for millions of rural families remains a distant goal. Hence, agriculture cannot afford to be ignored; it demands both policy attention and sustained innovation.

Among the key crops that anchor India's agricultural and industrial economies, cotton holds a central place. As one of the most important fiber and commercial crops, cotton contributes significantly not only to farm income but also to industrial growth, employment, and exports. India today accounts for nearly 25% of global cotton production, making it the world's largest cotton producer. In 2020–21, out of the 31.66 million hectares globally under cotton cultivation, India held the largest share in both cultivated area and output. Despite this achievement, India ranked third among cotton-exporting nations during the same period, with

5.5 million bales exported—behind the United States and Brazil (USDA, 2020–21). This suggests considerable potential to enhance our value chain and global competitiveness further.

Cotton's importance extends far beyond the farm. Nearly 6 million farmers across India depend directly on cotton cultivation, while another 40 to 50 million individuals are employed in processing, trade, and related sectors. The crop's role in India's textile industry is especially pronounced. Unlike global trends where synthetic fibers dominate, India maintains a 60:40 cotton-to-synthetic fiber usage ratio, underscoring the continued relevance of cotton in domestic production and consumption patterns.

Cotton not only provides clothing one of life's essentials but also contributes significantly to India's foreign exchange earnings. This is achieved through a complex value chain that includes the export of raw cotton, yarn, fabric, and finished textile goods such as garments and knitwear. For this reason, cotton is rightly known as 'White Gold', symbolizing its deep economic and cultural value in India. Among India's leading cotton-producing states, Karnataka holds the seventh position, contributing 382.43 lakh bales as of 2019 and cultivating the crop over 205.79 lakh hectares. Its role in India's cotton economy, while smaller in scale compared to states like Maharashtra and Gujarat, remains critical, especially in terms of livelihood support for small and marginal farmers.

2. Objectives of the Study

The main objectives of the study are as follows:

1. To study the performance and growth trends in the area, production, yield, and consumption of the cotton sector in Karnataka.
2. To analyze the major district-wise trends in the growth of cotton production in Karnataka.

3. Hypothesis

1. There exists a statistically significant and positive relationship between the area under cultivation and the production of cotton in Karnataka.

4. Methodology

The present study is primarily based on secondary data. The data on the area, production, and yield of cotton cultivation was collected from various sources including the Cotton Corporation of India Ltd., Department of Agriculture, Ministry of Textiles, All India Coordinated Cotton Improvement Project, Directorate of Economics and Statistics (Government of Karnataka), Economic Surveys of India and Karnataka, and World Bank reports. Additional information was gathered from scholarly journal articles, specialized publications, and seminal books authored by experts in cotton cultivation. Time series data covering the period from 2008-09 to 2019-20 were used for the analysis. Statistical tools such as the mean, Annual Growth Rate (AGR), Compound Annual Growth Rate (CAGR), and Pearson correlation were employed. The data analysis was carried out using Microsoft Excel, SPSS version 21, and Gretl statistical software.

5. Performance of Cotton Cultivation in Karnataka

Cotton is one of the major commercial crops of Karnataka. Currently, the state ranks seventh among the largest cotton-producing states in India. Cotton is primarily cultivated in the plateau regions of North Karnataka, where the climate and soil conditions are ideal for its growth. According to the Cotton Corporation of India (2018), the key cotton-growing districts in the state include Dharwad, Kalaburagi (Gulbarga), Ballari, and Belagavi. In Karnataka, both hybrid and high-yielding varieties of cotton are cultivated, particularly in districts like Raichur, Bagalkot, Vijayapura, Ballari, Dharwad, and Belagavi, mostly under irrigated conditions. Rainfed cotton, supported by assured rainfall, is predominantly grown in regions such as Dharwad, Belagavi, Shivamogga, Mysuru, and Karwar. In 2019, Karnataka contributed 382.43 lakh bales of cotton to the national total, with 205.79 lakh hectares under cotton cultivation.

The North Karnataka Plateau serves as the main region for cotton cultivation, owing to its favorable agro-climatic conditions. Major cotton-producing districts in this region include Dharwad, Kalaburagi, Ballari, and Belagavi. Karnataka accounts for 4.22% of India's total cotton production, while occupying 5.13% of the national area under cotton cultivation. Cotton is a vital fiber crop that supplies raw material for the textile industry. It is also used in the production of carpets, mattresses, and pillows. Additionally, cottonseed is processed to produce cooking oil, while the leftover cottonseed cake is commonly used as cattle feed. The main cotton-producing districts in Karnataka are Haveri, Dharwad, Gadag, Mysuru, Ballari, Raichur, Kalaburagi, Belagavi, Davanagere, Chitradurga, Koppal, and Vijayapura, with Haveri district ranking first in cotton production, followed by Dharwad.

6. Growth in Area, Production and Yield of Cotton in Karnataka

Cotton cultivation is one of the most important components of Karnataka's economy. The state's topography, particularly its soil and climate make it well-suited for cotton farming. Cotton production provides employment to a large portion of Karnataka's population, especially in rural areas. According to the Economic Survey of Karnataka as of 2019–20, cotton was cultivated on 205.79 lakh hectares in the state, yielding 382.43 lakh bales, with an average productivity of 186.37 kg/ha (Directorate of Economics and Statistics in Karnataka, 2024). The major Bt cotton-growing districts in Karnataka include Yadgir, Kalaburagi, Bidar, Raichur, Ballari, Koppal, Bagalkot, Davanagere, and Mysuru. The year-wise trends in area, production, and yield of cotton are presented in Table-1. However, these trends have shown considerable fluctuations across the years in the state

Table –1 Growth in Trends of Cotton Cultivation in Karnataka from 2008-09 to 2019-20

Year	Area (In Lakh Hectare)	Production (In Bales)	Yield (Kg/Hectare)
2008-09	100.03	135.48	131.92
2009-10	115.06	115.78	100.86
2010-11	137.78	188.85	137.49
2011-12	143.51	197.47	138.13
2012-13	125.19	184.92	148.00
2013-14	166.68	278.27	167.36
2014-15	220.82	373.17	169.56
2015-16	161.68	182.02	112.92
2016-17	128.43	158.94	124.24
2017-18	137.77	290.87	211.95
2018-19	180.86	229.89	127.53
2019-20	205.79	382.43	186.37
Mean	**151.97**	**226.51**	**146.36**
CAGR	**4.37**	**6.91**	**2.66**
Std. error	**0.015**	**0.024**	**0.016**
t-value	**2.860**	**2.795**	**1.595**
Sig.	**0.017**	**0.018**	**0.418**

Source: 1) Annual Report of Committee on Cotton Production and Consumption (COCPC), India– 2008 to 2019.

2) Directorate of Economic and Statistic, Karnataka – 2009 to 2019.

The above table and graph illustrate the growth trend in cotton cultivation in Karnataka from 2008–09 to 2019–20. The area under cotton cultivation was 100.03 lakh hectares in 2009–10, which increased significantly to 220.82 lakh hectares in 2014–15. However, it declined sharply to 128.43 lakh hectares in 2016–17, before rising again to 205.79 lakh hectares in 2019–20. In terms of production, Karnataka recorded 135.48 lakh bales of cotton in 2008–09. This figure rose substantially to 373.17 lakh bales in 2014–15, followed by a sharp decline to 158.94 lakh bales in 2016–17. Production then increased markedly to 382.43 lakh bales in 2019–20.

The yield performance of cotton cultivation in Karnataka over the years is presented in the above table. It can be observed that the yield has shown considerable fluctuations during the study period. In 2008–09, the yield was 131.92 kg/ha, which significantly declined to 100.86 kg/ha in 2009–10. It then increased steadily, reaching 169.56 kg/ha in 2014–15. However, the yield again dropped to 127.53 kg/ha in 2018–19, before rising significantly to 186.37 kg/ha in 2019–20.

It is evident from the above table that the variables—area, production, and yield under cotton cultivation have shown growth rates over the study period. However, only area and production have demonstrated statistically significant growth, while the yield has not. The Compound Annual Growth Rate (CAGR) for area, production, and yield under cotton cultivation in Karnataka was 4.37%, 6.91%, and 2.66%, respectively, indicating overall growth in the state's cotton cultivation sector.

7. District-wise Cotton Production in Karnataka

Karnataka contributes 4.22% to India's total cotton production, utilizing 5.13% of the country's total area under cotton cultivation. The North Karnataka Plateau is the primary region for cotton farming in the state. Major cotton-producing districts include Yadgir, Kalaburagi, Raichur, Ballari, Dharwad, Vijayapura, Belagavi, Gadag, Haveri, Mysuru, Chitradurga, Koppal, and Chamarajanagar. Table–2 presents district-wise data on cotton production in Karnataka from the year 2018–19 onward.

Table –2 Major District of Cotton Production in Karnataka (2018 to 2019) (In Bales)

S. No	District	2018-19	%	2019-20	%	Growth Rate between 2018 and 2019
1	Belagavi	167339	11.95	93332	4.01	55.77
2	Vijayapura	59160	4.22	104870	4.5	177.27
3	Kalburgi	203077	14.5	379566	16.29	186.91
4	Raichur	218909	15.63	363643	15.61	166.12
5	Koppal	12711	0.91	14716	0.63	115.77
6	Gadag	32893	2.35	84785	3.64	257.76
7	Dharwad	76592	5.47	166041	7.13	216.79
8	Haveri	154751	11.05	75596	3.25	48.85
9	Ballari	119990	8.57	172586	7.41	143.83
10	Chitradurga	16556	1.18	31073	1.33	187.68
11	Mysuru	54633	3.9	45536	1.95	83.35
12	Chamarajanagara	8527	0.61	12767	0.55	149.72
13	Yadgiri	256612	18.32	757598	32.52	295.23
14	Others	18722	1.34	27441	1.18	146.57
	Total of State	**1400472**	**100.00**	**2329550**	**100.00**	**166.34**

Source: Government of Karnataka (2024), Karnataka briefly – Statistical Report – 2024

Graph–2 Major District of Cotton Production in Karnataka (2018 to 2019)
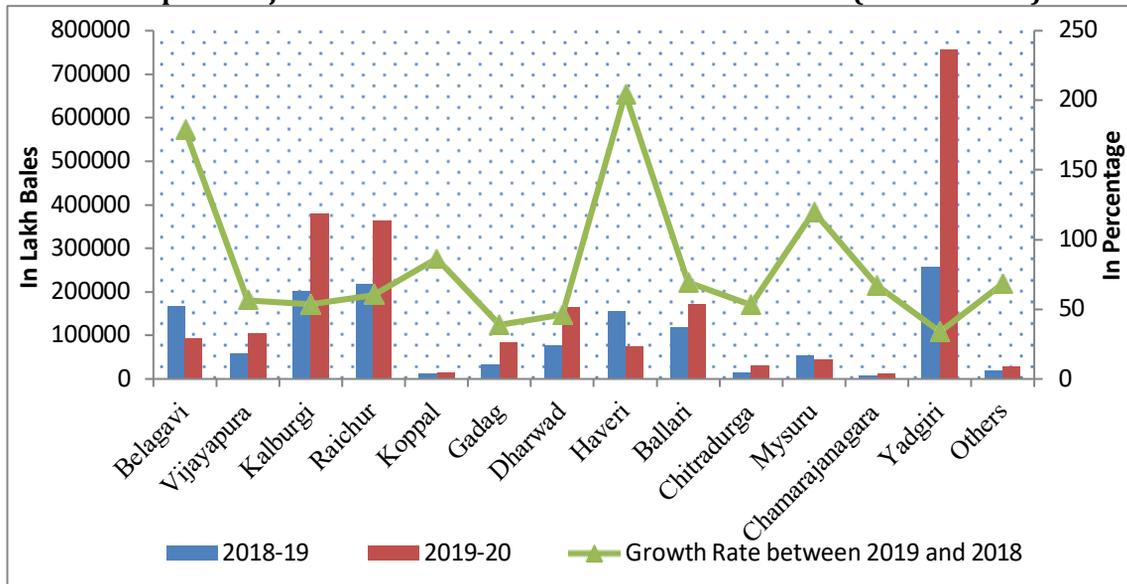

Table-2 and Graph-2 present the major district-wise cotton production in Karnataka for the period from 2018–19 to 2019–20. Among the 14 major cotton-producing districts in the state, Yadgir recorded the highest production, with 757,598 lakh bales in 2019–20, compared to 256,612 lakh bales in 2018–19, reflecting a remarkable growth rate of 295.23% during the period. Kalaburagi (Kalburgi) district ranked second, with production increasing from 203,077 lakh bales in 2018–19 to 379,566 lakh bales in 2019–20, showing a growth rate of 186.91%. Raichur district secured the third position, producing 363,643 lakh bales in 2019–20, up from 218,909 lakh bales in 2018–19, representing a growth rate of 166.12% over the research period.

Ballari district recorded the fourth-highest cotton production in 2019–20, with 172,586 bales, up from 119,990 bales in 2018–19, reflecting a growth rate of 143.83% during the study period. Dharwad district ranked fifth, with cotton production increasing to 166,041 bales in 2019–20, compared to 76,592 bales in 2018–19. Vijayapura district secured the sixth position, with production rising to 104,870 bales in 2019–20 from 59,160 bales in 2018–19, representing a growth rate of 77.27% over the period (Economics Survey of Karnataka, 2024).

Belagavi district ranked seventh in cotton production, recording 363,643 bales in 2019–20 compared to 218,909 bales in 2018–19, marking a growth rate of 66.14% (Note: You mentioned 55.77%, but the actual growth based on your figures is 66.14%. Gadag district ranked eighth, with production increasing from 32,893 bales in 2018–19 to 84,785 bales in 2019–20, a significant growth rate of 157.81%. Haveri district ranked ninth but experienced a decline in cotton production, dropping from 154,751 bales in 2018–19 to 75,596 bales in 2019–20. This decrease was primarily due to insufficient rainfall and lack of irrigation facilities. Mysuru district held the tenth position with 45,536 bales in 2019–20, down from 54,633 bales in 2018–19, reflecting a negative growth rate of -16.65%. Chitradurga district ranked eleventh, with production increasing from 16,556 bales in 2018–19 to 31,073 bales in 2019–20, resulting in a growth rate of 87.73% (Economics Survey of Karnataka, 2024).

The remaining 17 districts namely Bagalkot, Bidar, Uttara Kannada, Davanagere, Shivamogga, Udupi, Chikkamagaluru, Tumakuru, Kolar, Bengaluru (Urban), Bengaluru (Rural), Mandya, Hassan, Dakshina Kannada, Kodagu, Chikkaballapura, and Ramanagara, collectively rank twelfth in cotton production. Their combined output increased from 18,722 bales in 2018–19 to 27,441 bales in 2019–20, reflecting a growth rate of 46.57%. (Note: You mentioned 146.57%, but the correct percentage increase is approximately 46.57%. Koppal district ranks

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thirteenth, with cotton production rising from 12,711 bales in 2018–19 to 14,716 bales in 2019–20, showing a growth rate of 15.77%. Chamarajanagar district ranks last in cotton production, increasing from 8,527 bales in 2018-19 to 12,767 bales in 2019–20. This reflects a growth rate of 49.69% during the study period (Directorate Economics and Statistics in Karnataka, 2024)).

8. Testing of Hypothesis

1. There exists a statistically significant and positive relationship between the area under cultivation and the production of cotton in Karnataka.

Table – 3 Correlation Between Area and Production of Cotton Cultivation in Karnataka

Variables	Mean	Std. Devi	Pearson Correlation	Sig.
Area (In Lakhs Ha.)	151.9667	36.41702	.867**	0.000
Production (In Lakhs Bales)	226.5075	87.24934		

**. Correlation is significant at the 0.01 level (2-tailed).

The table shows the correlation between the area and production of cotton cultivation in Karnataka. The calculated mean values for area and production are 151.97 and 226.51 respectively, while the standard deviation values are 36.42 and 87.25 respectively. The Pearson correlation coefficient was found to be 0.867, indicating a strong positive correlation between the two variables. Therefore, the null hypothesis is rejected, and it can be concluded that there is a significant positive correlation between the area under cultivation and the production of cotton in Karnataka.

9. Concluding Remarks

Cotton continues to be a key pillar of India's agricultural and industrial landscape, cultivated across nearly twelve states. The country's self-reliance in fabric and clothing production can largely be attributed to its consistent surplus in cotton output. Thanks to a climate well-suited for cotton farming, India has not only sustained its growth in this sector but is also poised to become the world's leading cotton producer in the coming years.

The top ten cotton-producing states have played a major role in this achievement, contributing significantly to both national supply and export volumes. At the same time, India has backed production with a series of well-structured development initiatives aimed at strengthening every stage of the cotton value chain. These include the distribution of certified seeds, improved irrigation and water-use practices, modernised processing infrastructure, promotion of organic cultivation, and a strong focus on capacity-building through farmer education and training.

Such initiatives are not only intended to boost productivity but also to enhance the competitiveness of Indian cotton in global markets. The broader goal is clear: to ensure that cotton continues to support rural livelihoods, feed the textile industry's growing demand, and contribute meaningfully to the national economy. This vision holds particular importance for states like Karnataka, where cotton cultivation has the potential to uplift farming communities and bolster the state's economic resilience through improved exports and value addition.

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