

A Trend Study on Area and Production of Sericulture Cultivation in Karnataka: A Correlation Analysis

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Abstract

The sericulture sector occupies an important position in Karnataka's rural economy because of its employment-generating capacity, relatively intensive use of family labour, and contribution to farm income. Karnataka continues to be one of India's leading mulberry silk-producing states. The study has two objectives: 1) to examine the performance and growth of the sericulture sector in Karnataka and 2) to analyse the trend in growth of area under mulberry cultivation and raw silk production in the state. In Karnataka, mulberry cultivation expanded by 45.72 per cent, while raw silk production increased by 35.16 per cent. The results indicate a strong positive correlation between the area under mulberry cultivation and raw silk production in Karnataka. The Pearson correlation coefficient is $r = 0.9032$, which indicates that increases in mulberry cultivation area are strongly associated with increases in raw silk production. The mean area under mulberry cultivation during the study period was 104,577.60 ha, with a standard deviation of 12,902.27 ha. The mean raw silk production was 11,149.66 MT, with a standard deviation of 1,269.84 MT. The coefficient of determination ($R^2 = 0.8158$) indicates that approximately 81.58 per cent of the variation in raw silk production is associated with variation in the area under mulberry cultivation. The remaining variation may be related to other factors such as cocoon productivity, silkworm rearing efficiency, climatic conditions, disease incidence and technological practices. The p-value of 0.00034 is less than 0.01, indicating that the observed correlation is statistically significant at the 1%. Therefore, with $r = 0.9032$ and $p = 0.00034 < 0.01$, the null hypothesis is rejected, while the alternative hypothesis is accepted. The analysis therefore suggests that expansion of mulberry cultivation has been closely associated with increased silk production in Karnataka, although improvements in productivity, silkworm breeds, irrigation, rearing practices and reeling technology also influence output.

Keywords: Sericulture; Mulberry Area; Raw Silk Production; CAGR; Trend Analysis; Pearson Correlation Coefficient Analysis.

Introduction

Sericulture is an important agro-based, labour-intensive and employment-generating rural industry involving a wide range of activities, including mulberry cultivation, silkworm rearing, cocoon production, silk reeling, twisting, weaving, processing and marketing. Karnataka has historically occupied a leading position in India's silk industry and continued to retain its position as the leading producer of mulberry raw silk in the country. Then the Karnataka is the leading state in India for silk production, contributing about 70% of the country's total silk output. The sector makes a significant contribution to rural livelihoods by providing employment and income opportunities to farmers, reelers, weavers, traders and other participants across the silk value chain.

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Sericulture is predominantly concentrated in the southern and central parts of Karnataka, with major production centres located in Ramanagara, Chikballapur, Kolar, Mandya, Mysuru, Bengaluru Rural, Tumakuru and Chamarajanagar. In recent years, sericulture has also expanded into several non-traditional areas of the state. The growth and spatial expansion of the sector have been supported by the availability of suitable agro-climatic conditions, established silk markets, and skilled labour and government interventions. The performance of Karnataka's sericulture sector has improved considerably with the adoption of high-yielding mulberry varieties, improved bivoltine silkworm races, scientific silkworm-rearing practices, drip irrigation, disease-management measures and modern silk-reeling technologies. These technological interventions have contributed to improvements in cocoon quality, productivity and raw-silk production. Government schemes and financial assistance have further strengthened production infrastructure and encouraged technological modernization.

Objectives of the Study

1. To study the performance and growth of the sericulture sector in Karnataka.
2. To know the financial assistance for sericulture development in Karnataka.
3. To analyse the trend in growth of area under mulberry cultivation and raw silk production in the state.

Research Hypothesis

1. There is a significant correlation between the area under mulberry cultivation and raw silk production in Karnataka over the past few periods.

Material and Methods

The present study is based exclusively on secondary data sources. The required data on the area under mulberry cultivation and raw silk production in Karnataka were collected from authoritative sources, including the Central Silk Board (CSB), Ministry of Textiles, Government of India; Department of Sericulture, Government of Karnataka; and the Directorate of Economics and Statistics, Government of Karnataka. Additional information was obtained from the Economic Survey of Karnataka, annual reports and publications of the Government of Karnataka, and other relevant official reports. The study also draws upon research articles, books, academic journals and published literature relating to the growth, performance and development of the sericulture sector. The study covers a ten-year period from 2015–16 to 2024–25, with particular emphasis on changes in the area under mulberry cultivation and raw silk production in Karnataka.

Statistical Techniques of Analysis: The statistical tools, including percentage analysis, Annual Growth Rate (AGR), Compound Annual Growth Rate (CAGR), Trend Analysis, and Pearson's correlation coefficient, were employed to examine the degree and direction of association between the area under mulberry cultivation and raw silk production. The data were processed and statistically analysed using Microsoft Excel, SPSS version 21, EVIEWS and Gretl.

Sericulture Cultivation in Karnataka: Performance and Growth

Sericulture is one of the important agro-based and rural employment-generating sectors in Karnataka, playing a significant role in the socio-economic development of the state. Karnataka has historically occupied a prominent position in India's silk industry and continues to be a leading producer of mulberry raw silk. The sector is closely integrated with agriculture and provides livelihood opportunities to a large number of rural households through mulberry cultivation, silkworm rearing, cocoon production, silk reeling, twisting, weaving, processing and marketing. Unlike many agricultural activities, sericulture provides employment and income opportunities throughout the year and can be undertaken on relatively small landholdings. It is therefore particularly important for small and marginal farmers seeking to diversify their sources of rural income.

The growth of sericulture has considerable potential for generating both direct and indirect employment in rural Karnataka. Direct employment is created in mulberry cultivation and silkworm rearing, while additional employment is generated in cocoon markets, reeling units, silk processing, handloom and powerloom weaving,

transportation and related services. The sector also promotes rural entrepreneurship and supports the participation of women and family labour. Expansion of mulberry cultivation, adoption of improved silkworm varieties, scientific rearing practices, modern reeling technologies and better market infrastructure can further enhance productivity and employment opportunities. Thus, strengthening sericulture can contribute significantly to rural livelihood security, agricultural diversification, income generation and sustainable rural development in Karnataka. According to the Economic Survey of Karnataka (2025), Karnataka's raw silk production increased from 11,823 MT in 2022–23 to 12,463 MT in 2023–24 and to about 13,276 MT in 2024–25. The Central Silk Board reports that Karnataka has consistently remained the largest or one of the largest raw-silk-producing states in India. For example, raw silk production stood at 9,823 MT in 2015–16, 9,571 MT in 2016–17 and 9,322 MT in 2017–18 before rising to 11,592 MT in 2018–19.

Financial Assistance for Sericulture Development in Karnataka

Government financial support has played a significant role in promoting and strengthening the sericulture sector in Karnataka. During 2025–26, a total budgetary provision of Rs.395.110 crore was allocated to the Department of Sericulture under State Sector and District Sector schemes. In addition, Rs.13.736 crore was provided under the Centrally Sponsored Pradhan Mantri Krishi Sinchai Yojana (PMKSY), while Rs.78.210 crore was allocated under the Central Sector Silk Samagra scheme. Consequently, the total financial allocation for the development of the sericulture sector amounted to Rs.487.059 crore during 2025–26. The financial assistance was directed towards supporting sericulturists, improving production infrastructure, promoting irrigation and strengthening technological interventions across the silk value chain. Up to December 2025, financial assistance amounting to Rs.5,740.28 lakh was provided to sericulturists, while Rs.602.05 lakh was extended to silk reelers. Such financial interventions are important for reducing production constraints, encouraging the adoption of improved technologies and enhancing the productivity and quality of silk production.

The substantial allocation under both State and Central schemes demonstrates the government's continued commitment to the development of Karnataka's sericulture sector. Financial assistance to farmers and reelers, together with investments in irrigation, production infrastructure and technological modernization, can contribute to higher productivity, employment generation and improved income opportunities in rural areas. Thus, sustained public investment remains an important component of the long-term growth and competitiveness of Karnataka's sericulture industry.

Table-1 : Scheme Wise Fund Allocation for Sericulture Sector in Karnataka - 2025

Sl. No.	Scheme / Source of Funding	Budget Allocation (Rs.in Crore)	Share of Total Allocation (%)
1	State Sector and District Sector Schemes	395.110	81.12
2	Pradhan Mantri Krishi Sinchai Yojana (PMKSY) – Centrally Sponsored Scheme	13.736	2.82
3	Silk Samagra – Central Sector Scheme	78.210	16.06
	Total	487.059	100.00

Source: Government of Karnataka, Economic Survey 2025–26.

The above table data show that state and district sector schemes accounted for the dominant share (81.12%) of the total sericulture budget, followed by Silk Samagra (16.06%) and PMKSY (2.82%). Financial assistance was also strongly oriented towards primary producers, with sericulturists receiving 90.51% of the assistance provided to the two beneficiary categories up to December 2025.

Results and Discussion

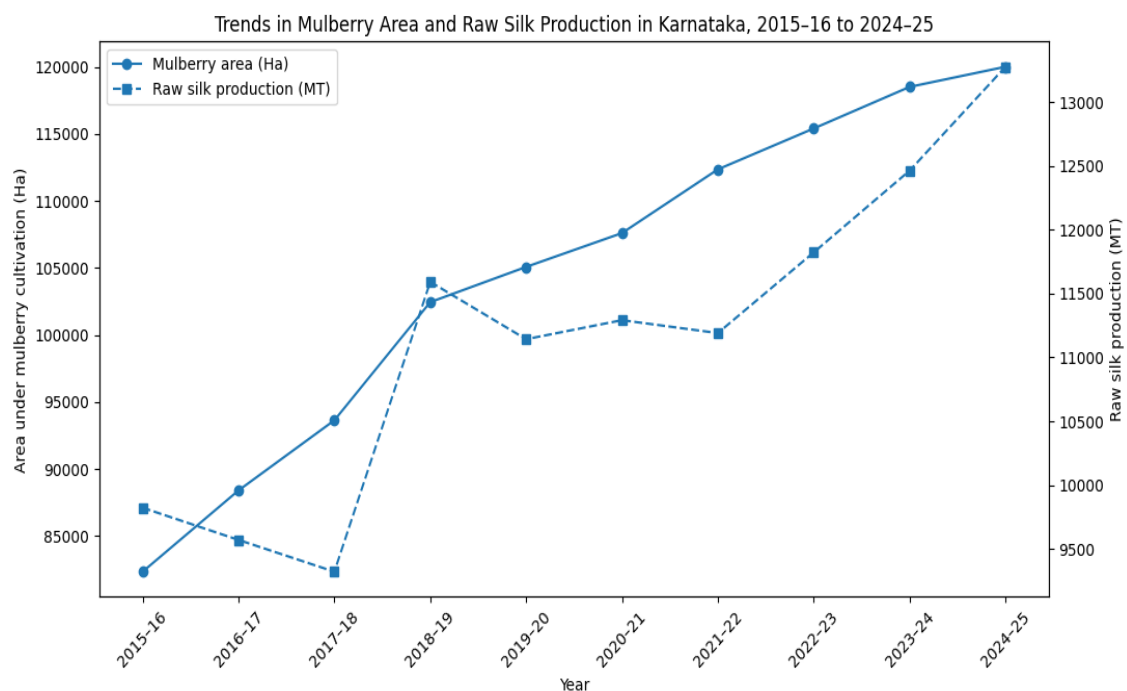
Trends in Growth Area under Mulberry Cultivation and Silk Production of Sericulture Cultivation in Karnataka

Karnataka is one of the leading silk-producing states in India. During 2024–25, the state produced 13,276.64 MT of raw silk, accounting for approximately 32 per cent of India's total raw silk production. The major silk-producing districts of Karnataka include Mandya, Kolar, Chikkaballapura and Ramanagara, which constitute important centres of mulberry cultivation, silkworm rearing and silk production. Karnataka contributes approximately 45 per cent of India's total mulberry silk output, highlighting its dominant position in the country's sericulture sector. Moreover, mulberry silk accounts for nearly 100 per cent of the state's total silk production, reflecting the state's strong specialization in mulberry-based sericulture. At the national level, Andhra Pradesh and Assam occupy the second and third positions, respectively, in silk production during 2024–25. Thus, Karnataka continues to play a pivotal role in India's silk economy through its extensive mulberry cultivation, large sericulture base and significant contribution to national raw silk production.

Table-2 : Trends in Mulberry Area and Raw Silk Production in Karnataka from 2015 to 2024

Year	Area under Mulberry Cultivation (In Ha)	Raw Silk Production (MT)
2015–16	82,350	9,823.00
2016–17	88,410	9,571.00
2017–18	93,640	9,322.00
2018–19	102,450	11,592.00
2019–20	105,076	11,143.00
2020–21	107,600	11,292.00
2021–22	112,350	11,191.00
2022–23	115,400	11,823.00
2023–24	118,500	12,463.00
2024–25	120,000	13,276.64

Source: Compiled from Central Silk Board (2015 to 2024), Department of Sericulture, Government of Karnataka, Karnataka Economic Survey (2015 to 2025) and published sericulture statistics.



The table and graph present the trends in area under mulberry cultivation and raw silk production in Karnataka from 2015–16 to 2024–25. The area under mulberry cultivation increased steadily from 82,350 ha in 2015–16 to 120,000 ha in 2024–25, registering an overall increase of 45.72 per cent. The area crossed 1 lakh ha in 2018–19 and continued to expand thereafter. This indicates the sustained importance of mulberry cultivation and the expansion of the sericulture base in Karnataka. Raw silk production increased from 9,823 MT in 2015–16 to 13,276.64 MT in 2024–25, representing an overall increase of 35.16 per cent. However, production declined during the initial years, falling to 9,322 MT in 2017–18. It then increased sharply to 11,592 MT in 2018–19. Moderate fluctuations occurred between 2019–20 and 2021–22, after which production increased continuously from 11,191 MT in 2021–22 to 13,276.64 MT in 2024–25.

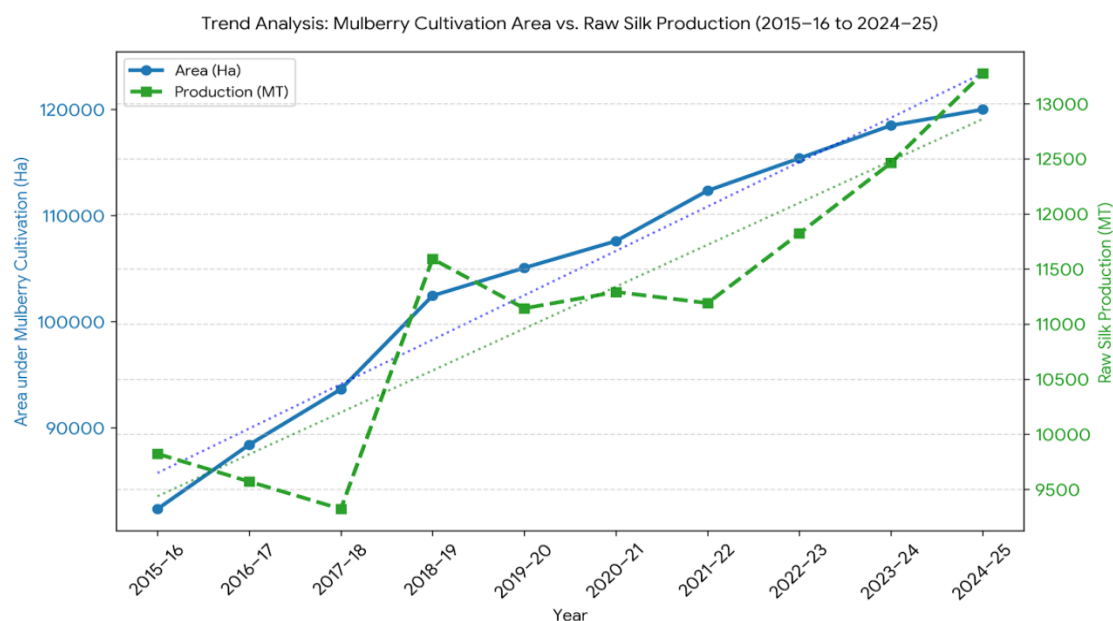
Trend Analysis of Mulberry Area and Raw Silk Production in Karnataka

As shown in the result table-3, the data indicate a clear long-term expansion of Karnataka's mulberry cultivation and raw silk production during 2015–16 to 2024–25. The area under mulberry cultivation increased from 82,350 ha in 2015–16 to 120,000 ha in 2024–25, representing an overall increase of 45.72 per cent. The estimated CAGR of mulberry area was 4.27 per cent per annum.

Table-3 : Trend Analysis of Mulberry Area and Raw Silk Production in Karnataka from 2015 to 2024

Indicator	2015–16	2024–25	Overall Change	CAGR	Trend Coefficient	R ²
Mulberry area (Ha)	82,350	120,000	45.72%	4.27%	4,184.87 Ha/year	0.9644
Raw silk production (MT)	9,823	13,276.64	35.16%	3.40%	380.47 MT/year	0.8229

Source: Compiled Data by Researcher



The linear trend analysis further confirms the upward movement. The annual trend coefficient for mulberry area was approximately 4,184.87 ha per year, with an R² of 0.9644, indicating that about 96.44 per cent of the variation in area is explained by the linear time trend. For raw silk production, the trend coefficient was approximately 380.47 MT per year, with an R² of 0.8229, indicating a strong positive trend, although production experienced greater year-to-year fluctuations than cultivated area. Karnataka's sericulture sector demonstrates a strong and sustained expansion in mulberry cultivation, accompanied by a substantial increase in raw silk production. The higher R² for mulberry area indicates a more consistent upward trend, whereas raw silk production is relatively more volatile, suggesting that

factors beyond cultivated area—such as productivity, silkworm rearing conditions, cocoon yield and climatic conditions—also influence silk output.

Testing Hypothesis

H₀: There is no significant correlation between the area under mulberry cultivation and raw silk production in Karnataka over the past few periods.

H₁: There is a significant correlation between the area under mulberry cultivation and raw silk production in Karnataka over the past few periods.

Table-4 : Pearson's Correlation between Mulberry Area and Raw Silk Production in Karnataka from 2015 to 2024

Variables	N	Mean	Standard Deviation (SD)	Pearson Correlation (r)	R ²	p-value	Significance
Area under Mulberry Cultivation (Ha)	10	104,577.60	12,902.27	0.9032	0.8158	0.00034	Significant at 1% level
Raw Silk Production (MT)	10	11,149.66	1,269.84	0.9032	0.8158	0.00034	Significant at 1% level

Source: Compiled Result by the Researcher

The results indicate a strong positive correlation between the area under mulberry cultivation and raw silk production in Karnataka. The Pearson correlation coefficient is $r = 0.9032$, which indicates that increases in mulberry cultivation area are strongly associated with increases in raw silk production. The mean area under mulberry cultivation during the study period was 104,577.60 ha, with a standard deviation of 12,902.27 ha. The mean raw silk production was 11,149.66 MT, with a standard deviation of 1,269.84 MT. The coefficient of determination ($R^2 = 0.8158$) indicates that approximately 81.58 per cent of the variation in raw silk production is associated with variation in the area under mulberry cultivation. The remaining variation may be related to other factors such as cocoon productivity, silkworm rearing efficiency, climatic conditions, disease incidence and technological practices. The p-value of 0.00034 is less than 0.01, indicating that the observed correlation is statistically significant at the 1%. Therefore, $r = 0.9032$ and $p = 0.00034 < 0.01$, the null hypothesis is rejected, while the alternative hypothesis is accepted.

Major Findings

- Karnataka continues to occupy a significant position in India's sericulture economy because of its favourable agro-climatic conditions, established silk-production infrastructure, skilled farmers and institutional support.
- The study reveals an overall positive trend in sericulture development in Karnataka during the study period, although year-to-year fluctuations were observed in the area under mulberry cultivation and raw silk production.
- The area under mulberry cultivation and raw silk production moved broadly in the same direction, indicating that expansion of mulberry cultivation has contributed to strengthening silk production in the state.
- The annual trend coefficient for mulberry area was approximately 4,184.87 ha per year, with an R^2 of 0.9644, indicating that about 96.44 per cent of the variation in area is explained by the linear time trend. For raw silk production, the trend coefficient was approximately 380.47 MT per year, with an R^2 of 0.8229, indicating a strong positive trend, although production experienced greater year-to-year fluctuations than cultivated area.
- The Pearson correlation analysis shows a strong positive relationship between mulberry area and raw silk production, with a correlation coefficient of $r = 0.9032$.

- The coefficient of determination ($R^2 = 0.8158$) indicates that approximately 81.58% of the variation in raw silk production is statistically associated with changes in the area under mulberry cultivation.
- The relationship is statistically significant ($p < 0.01$), providing strong evidence that changes in mulberry cultivation area are closely associated with changes in raw silk production.
- The trend analysis indicates that the sericulture sector has considerable potential for income generation, rural employment and agricultural diversification, particularly in regions traditionally dependent on sericulture.

Suggestions and Conclusion

The study concludes that sericulture continues to be an important component of Karnataka's agricultural sector and rural economy. The empirical findings reveal a strong and statistically significant positive relationship between the area under mulberry cultivation and raw silk production. The Pearson correlation coefficient of 0.9032 and R^2 value of 0.8158 indicate that expansion in mulberry cultivation is closely associated with an increase in raw silk production. However, sustained growth in the sericulture sector cannot be achieved through expansion of cultivated area alone. Greater attention is required to enhance mulberry productivity, promote high-yielding and disease-resistant silkworm breeds, strengthen disease-management practices, improve irrigation facilities, encourage the adoption of modern technologies, and provide better access to markets and institutional support.

Therefore, an integrated approach combining area expansion, productivity enhancement, technological modernization and effective government interventions is essential for the sustainable development of sericulture in Karnataka. Strengthening these measures can enhance the income and livelihood security of sericulture farmers while improving the overall productivity and competitiveness of the sector. The study thus establishes that the expansion of mulberry cultivation, supported by appropriate technological advancements and institutional support, can play a significant role in ensuring the long-term growth and sustainability of Karnataka's sericulture sector and further consolidating its position as one of India's leading silk-producing states.

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