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THE ANALYTICAL STUDY ON GROWTH AND DEVELOPMENT IN SERICULTURE SECTOR IN KARNATAKA

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Abstract

Sericulture plays a crucial role in India's rural economy, providing livelihoods to millions of farmers and workers. It is particularly significant in Karnataka, where a large number of rural families rely on silk farming as a primary or secondary source of income. Beyond rural areas, the silk industry also engages a large number of urban poor, particularly in activities like silk reeling and weaving. In India, the wealth generated from the silk industry is often transferred indirectly from the richer sections of society, who consume expensive silk products, to the poorer sections, who are involved in cocoon farming and raw silk production. One of the major challenges in India's sericulture sector, particularly in Karnataka, is the high cost of production at the three key levels: mulberry leaf cultivation, silkworm cocoon production, and silk yarn production. These costs are substantially higher in India compared to China, which is the world leader in silk production. The main reason for this difference is the lower productivity levels in India, especially in Karnataka. While China benefits from higher yields and more efficient processes, Indian farmers face difficulties in increasing productivity. Factors such as climate, lack of modern techniques, and inadequate resources contribute to the higher costs in India.

Key Words: **Cultivation, Silkworm Rearing, Silk Cocoons, Raw Silk Production etc.**

Introduction:

Sericulture made inroads into Princely Mysore during the period of Tippu Sultan.As discussed earlier, Tipu Sultan introduced sericulture in Mysore and gave great encouragement to its development. In later years, sericulture suffered a series of setback, but staged a comeback during the Second World War. When the war ended in mid-1940's, silk industry slumped as war related consumption ceased. Yet, as a result of the

war, the industry gained central recognition and patronage. Today, India is the second largest producer of silk in the world, after China and has the unique distinction of producing all the commercial varieties of silk viz., Mulberry, Tasar (temperate Tasar and tropical Tasar) Eri and Muga. Karnataka State in the country takes first position having an area of about 59 per cent, cocoon production is about 63 per cent and rawsilk production constituting about 66 per cent in the entire country (Central Silk Board 1999) and the other states like AP, TN, WB, J&K and 13 other states produce remaining just 34 per cent of the silk. Therefore, Karnataka State stands first either in terms of area or production of the cocoons and silk.

Importance of the Silk Industry:

Many studies on sericulture industry Narayana (1979), Hanumappa and Erappa (1985 and 1993), Hanumappa (1986), Thimmaiah and Rao (1986), Narayan and Nair (1989), Sinha (1989), Venkatanarasaiah (1992), Naik and Babu (1993) and Gopalappa (1993, 1994, 1996, 1997a, 1997b, 1998, 1999 and 2002)), have shown high expectations from the silk sector in terms of generation of employment and income. Further, the industry has a strong equity orientation as large number of landless labourers, marginal and small farmers constituting around 85 per cent of the total sericulturists depend on this industry for their livelihood and cash requirements. In the non-farm sector, a large number of urban poor are also engaged in silk reeling activities. More importantly, the money is being transferred indirectly from the rich to the poor in the sense that a majority of the users of the silk products are the richer sections of the society, as silk products are costly, whereas the cocoon growers and rawsilk makers are from the poorer sections of the society. Thus, sericulture industry has its own significance in a country like India where the income inequality is high.

Growth of the Sericulture Sector in the Southern States and the Country:

- There was a general fluctuation in the area dedicated to sericulture over the years. In 2020, the area increased by 5.98%, but this was followed by negative growth in 2021 (-3.44%) and 2022 (-2.02%). However, the area saw a recovery in 2023 with a 3.69% increase. This suggests that while there was some decline in the sericulture area in the initial years, efforts to regain the land dedicated to sericulture were visible in 2023.
- Cocoon Production: Cocoon production showed positive growth in the first three years: 6.89% in 2020, 0.96% in 2021, and 0.20% in 2022. However, 2023 saw a significant increase of 3.64%, which could indicate better weather conditions or improvements in farming practices leading to better yields in cocoon production.
- Silk Production: Silk production has shown a steady upward trend over the years. It increased by 9.93% in 2020, 3.04% in 2021, and 2.12% in 2022. The growth continued into 2023, albeit at a higher rate of 6.23%, indicating consistent improvements in silk yield.

2. **Karnataka State Trends (2020–2023):**

- Area: Karnataka experienced a mixed trend in the area dedicated to sericulture. There was a positive increase of 2.59% in 2020, followed by a decrease in 2021 (-1.03%) and a more significant drop in 2022

(-3.32%). However, the area recovered in 2023 with a significant growth of 4.85%. This suggests a pattern of fluctuations, possibly due to environmental factors or changes in the government's support for sericulture.

- Cocoon Production: Karnataka's cocoon production increased by 5.05% in 2020, showing a positive trend. In 2021, it grew by 3.78%, but then a decline of -1.70% was recorded in 2022. However, there was a recovery in 2023, with cocoon production increasing by 5.20%. This indicates that while challenges were faced, improvements were seen in the most recent year.
- Silk Production: Silk production in Karnataka experienced significant fluctuations. In 2020, it grew by 8.85%, but in 2021, it showed a slight decline of -0.64%. However, there was an increase of 4.83% in 2021, followed by a decline of -0.64% in 2022. In 2023, Karnataka saw a recovery in silk production with an increase of 4.90%, signaling positive outcomes in silk yield.

These trends indicate that while there is growth in the Indian sericulture sector, challenges related to productivity, environmental factors, and market conditions still persist. Technological interventions, research, and skill development could help stabilize and further improve production rates across different states in India.

Table-1 Growth Performance of Sericulture Sector in the Country and few Important States.

Particulars	2020	2021	2022	2023
All India				
Area	5.98	-3.44	-2.02	3.69
Cocoons Production	6.89	0.96	0.20	3.64
Silk Production	9.93	3.04	2.12	6.23
Karnataka State				
Area	2.59	-1.03	-3.32	4.85
Cocoons Production	5.05	3.78	-1.70	5.20
Silk Production	8.85	4.83	-0.64	4.90
Andhra Pradesh*				
Area	12.24	8.22	-5.47	-2.21
Cocoons Production	13.85	-0.39	-0.06	3.10
Silk Production	18.36	2.43	-0.39	1.03
Tamilnadu*				
Area	8.07	14.81	5.59	5.17
Cocoons Production	4.53	-8.76	10.98	6.60
Silk Production	6.60	-3.63	13.52	5.84

Source: CSB(2024).

- Tamil Nadu saw a steady increase in the area dedicated to sericulture. In 2020, the area increased by 8.07%, followed by 14.81% in 2021. Though there was some reduction in 2022 (-5.47%), it rebounded in 2023 with a growth of 5.17%. This indicates that Tamil Nadu is actively expanding its sericulture area, though it has experienced some fluctuations.

- **Cocoon Production:** Cocoon production in Tamil Nadu showed mixed trends. In 2020, there was a growth of 4.53%, but in 2021, it saw a decline of -8.76%. In 2022, there was a recovery with an increase of 10.98%, and in 2023, production increased by 6.60%. This indicates a volatile trend, with production fluctuating based on various factors.

- **Silk Production**: Silk production in Tamil Nadu showed notable fluctuations as well. It increased by 6.60% in 2020, but in 2021, it decreased by -3.63%. In 2022, there was a significant increase of 13.52%, and in 2023, silk production grew by 5.84%, signaling an overall positive growth despite some volatility.

It is surprising to know that the production of cocoons and raw silk exhibited a positive growth when the area under mulberry had actually declined. The main reason for such a situation has been that the productivity of silkworm layings has increased substantially during this period due to the adoption of improved scientific methods. In the early part of eighties, the local variety of layings (there are three varieties of silkworms namely, uni-voltine, bivoltine (foreign race) and multivoltine (local variety)) were used to produce the cocoons. However, the farmers gradually switched over to crossbreed variety, which is prepared by crossing the bi-voltine and multivoltine varieties. This has resulted in the increase of cocoon production. The positive growth in the productivity of raw silk is due to the technological advancement in the silk reeling industry. Man-driven wooden charka has been replaced by the power-driven charkas and cottage basin silk reeling technologies. There are three silk reeling technologies viz., charka, cottage basin and filature. Among these, cottage basin reeling technology is quite prominent in Karnataka and TN and charka reeling in AP.

The Status of Foreign Trade:

The provided reflects the trends in India's foreign exchange earnings and sericulture export earnings over different periods, highlighting the significant role of the silk industry in the country's export performance. During the period from 1971-72 to 1989-90, India's total foreign exchange earnings grew at a Compound Growth Rate (CGR) of 14.28% per annum, which was a healthy growth rate overall. However, sericulture export earnings performed exceptionally well during this period, growing at a much higher rate of 24.06% per annum. This indicates that the silk industry, during this period, was one of the key contributors to India's foreign exchange earnings, outpacing other sectors in export growth. From 1990-91 to 2001-02, the period following India's economic liberalization saw general export earnings grow at a CGR of 17.78% per annum. However, the **sericulture export earnings** grew at a lower rate of 14.01% per annum, which is almost half the growth rate seen in the earlier period before liberalization.

This slowdown in the silk sector's export growth during the liberalization period could be attributed to several factors, including the increased competition from other countries in the silk production industry (like China), changes in trade policies, and possibly lower productivity or technological challenges in the domestic sericulture sector. In the period from **2002-03 to 2010-11**, India's total foreign exchange earnings grew at a **CGR of 17.45% per annum**, which indicates continued growth in the overall economy and exports. However, the growth of

sericulture export earnings during this period drastically slowed to a mere 1.76% per annum. From 2011-12 to 2023-24, the total foreign exchange earnings of India grew at a CGR of 3.79% per annum, reflecting more modest growth in the economy and exports during this period. However, sericulture export earnings showed a negative growth rate of -4.38% per annum, indicating a decline in India's silk exports during this period. Countries like China have further solidified their position as the largest producer and exporter of silk, making it even more difficult for India to maintain or grow its export share. Karnataka, the largest producer of silk in India, might have faced productivity and quality challenges, as well as a lack of technological advancements to compete in the global market.

Table-2: Growth Rate of Foreign Exchange Earnings.

Period of Growth	Total exports Earnings	Exports Earnings from Sericulture
1971-72 to 1989-90	14.28	24.06
1990-91 to 2001-02	17.78	14.01
2002-03 to 2010-11	17.45	1.76
2011-12 to 2023-24	3.79	-4.38

Graph -2: Growth Rate of Foreign Exchange Earnings.

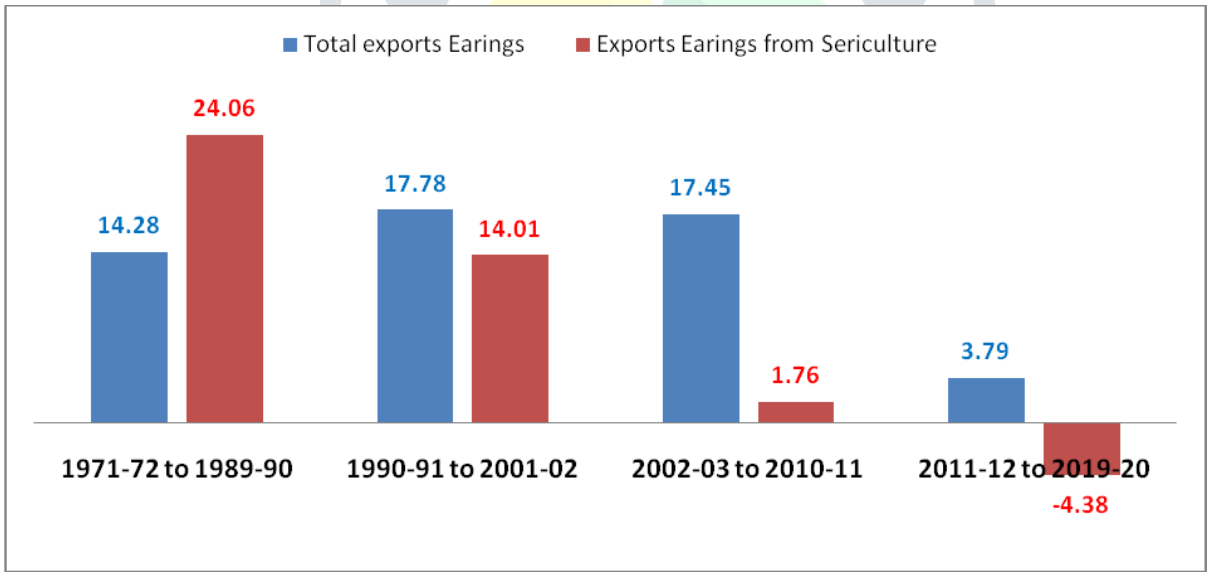


Table-3, presents the actual value of silk imports and also the exports. As it is presented in the table it is clear that the actual value of silk imports has been increasing from 1991-92 to 1999-2000. The value of imports was only Rs. 147 crores in 1991-92, which had gone up to Rs. 490 corers during 1999-2000 showing a percentage change of 116.67 per cent per annum. Whereas the silk exports have been showing a percentage change of about 80.85 per cent per annum during the same period, Further the data analysis reveals that the imports are growing at an increasing rate and in case of exports it is declining rate.

Table No-3:

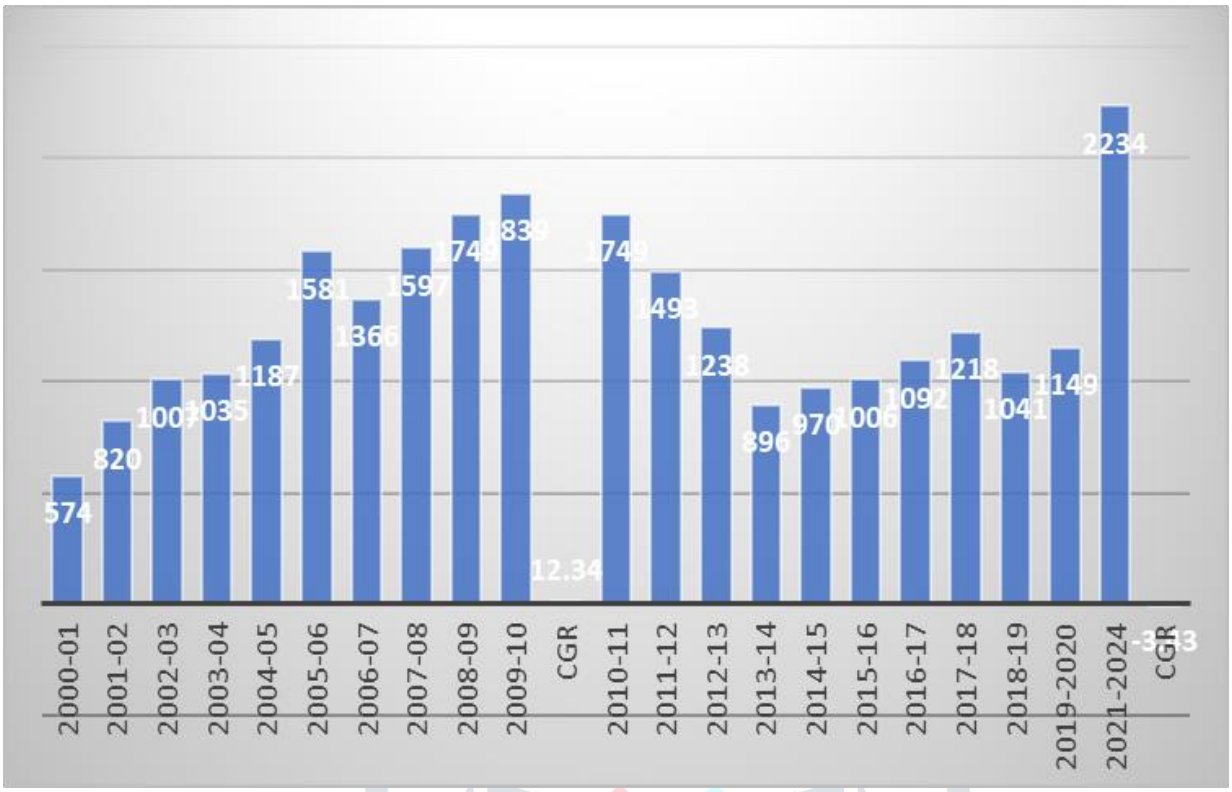
The Status of International Trade of the Silk Products

Year	Imports (Value in Crores)	Exports (Value in Crores)
2000-01	574	2423
2001-02	820	2360
2002-03	1007	2294
2003-04	1035	2779
2004-05	1187	2879
2005-06	1581	3194
2006-07	1366	3338
2007-08	1597	2727
2008-09	1749	3178
2009-10	1839	2892
CGR	**12.34**	**3.20**
2010-11	1749	2863
2011-12	1493	2353
2012-13	1238	2303
2013-14	896	2480
2014-15	970	2829
2015-16	1006	2495
2016-17	1092	2093
2017-18	1218	1649
2018-19	1041	2031
2019-2020	1149	1748
2021-2024	2234	2555
CGR	**-3.43**	**-4.60**

Source: Central Silk Board, Bengaluru.

Graph No-3:

The Status of International Trade of the Silk Products



The CGR of Imports of silk products during the decade 2000-01 to 2009-10 is 12.34 per cent where as that of exports it is just 3.20 per cent. The CGR for the next decade i.e., 2010-11 to 2019-20 has decreased drastically and stands at -3.4 per cent and -4.60 per cent respectively. The overall CGR for the period 2000-01 to 2019-20 is 0.74 per cent for the imports of silk products and -1.78 per cent for the exports of silk products towards this, for more clarity,

Current Status of the Sericulture Sector in Karnataka State:

Karnataka being the major silk producing state covering 50.20 and 55.07 per cent of the total area and the raw silk production respectively in the country (2001-02). However, in 2002-03 the production of raw silk has come down from 8,728 tonnes in 2001-02 to 6,760 tonnes showing an annual decline of about 29 per cent. If the trend continues like this there will not be any sericulture in the sericulture map of the State. However, there is no change in the number of sericulture villages and the families practicing sericulture from 1999-00 to 2002-03. The number of sericulture villages seems to be 19,207 and the number of families practicing sericulture is 2,55,941. Sericulture in the state is spread to all the 27 districts with 88,909 ha (2002-03) of mulberry including 17,424 ha under rainfed cultivation. The silk production has steadily increased from about 2,500 tonnes about two decades ago to the present level of over 8,700 tonnes. During 2002-03, however, the state produced 6760.35 tonnes of raw silk, the drop being mainly owing to the repeated drought associated with the influx of low price Chinese silk into the Indian market. The domestic production mainly comprised of the multi x bivoltine (CB) variety, which meets mainly the requirements of handloom industry

being the major consumer of silk in India. However, the power-loom industry specifically requires the bivoltine raw silk, which is better in quality compared to the CB variety silk. This expansion has been mainly attributed to the implementation of World Bank assisted Karnataka Sericulture Project (KSP-I) and KSP-II component of National Sericulture Project (NSP) during 1980s and 90s.There has been substantial reduction in the area of mulberry during recent years, which however, is not commensurate with the cocoon and raw silk production indicating higher levels of productivity in recent years.

In addition, the major difference between the Indian/Karnataka and Chinese sericulture Industry is seen with regard to the cost of production at the three levels namely, mulberry leaf, silkworm cocoon and the silk yarn, that being substantially higher in India. The major reason attributed for this, is the high productivity in China compared to the low levels prevalent in India/Karnataka. Major differences and related attributes are evident in respect of the agro-climatic being a moisture surplus sub-tropical situation in China to generally moisture deficient tropical situation in India/Karnataka. This calls for intensive efforts to reduce the cost of production associated with quality and productivity improvement through various approaches of which technological interventions and skill up-gradation play an important role (Source: The Director – Karnataka State Silk Development Institute).

Technology and its Impact:

The Department of Sericulture was established during 1914, to promote sericulture industry in the State of Karnataka. Sericulture was a subsidiary occupation to the rural people in the beginning. Gradually they realized the potential of the industry, which benefits the farmers quite significantly as a commercial crop. Sericulture since then has expanded manifold. With the scientific and technical nature of mulberry cultivation, silkworm rearing and silk reeling, and the inevitable integrated nature of these sectors, the Department of Sericulture has extended its objectives to exhaustively cover the areas from soil to the reeling industry. Thus, the Department plays a significant role in all aspects up to raw silk production. It provides service and advisory facilities in mulberry cultivation, silkworm rearing and cocoon – reeling, exclusively supervises and monitors the production and supply of basic silkworm seed and mulberry seed material. Organized basic seed multiplication programmes implemented by the Department especially in respect of the Pure Mysore race (the mother parent in the production of CB combination) in the notified seed area has been its prestigious prerogative, and serves as a major backbone of the Indian Silk Industry. The Department also provides marketing facility for cocoon and raw silk, facilitates and extends financial assistance to farmers and reelers, implements other incentive schemes, transfers the R & D output for the cause of sericulture expansion and development with the help of professional and technical staff.

Conclusion:

The sericulture industry has long been recognized as an important poverty alleviation program in India, particularly in states like Karnataka and Andhra Pradesh. The sericulture industry is seen as a means of income

redistribution, as it allows poor rural and urban populations to engage in silk production. This is significant because, while the wealthy are the primary consumers of silk products, the producers are typically marginal and small farmers. As highlighted by several studies (Gopalappa 1996, Hanumappa and Erappa 1985, Rajpurohit and Govindaraju 1983, Naik and Babu 1993, Sinha 1989, and Venkatanarasaiah 1992), sericulture has provided an opportunity for these farmers to improve their livelihoods. Consequently, many small and marginal farmers have been encouraged to take up sericulture farming as a secondary or primary source of income. However, recent trends have raised concerns about the future of the sericulture industry. Farmers are increasingly uprooting mulberry plants (the primary food source for silkworms) and turning to more profitable crops like onions, maize, sunflower, and vegetables. This shift, observed particularly in Karnataka and Andhra Pradesh, indicates the declining profitability of sericulture. The poor returns from sericulture have led farmers to seek alternative crops that offer better short-term gains.

Over the past few decades, significant investments have been made to develop the sericulture industry. The Central Silk Board (CSB) has implemented major projects like the Karnataka Sericulture Project-1 (KSP-1) and the National Sericulture Project (NSP). These programs were intended to promote the growth of sericulture and improve productivity in states like Karnataka, Andhra Pradesh, and Tamil Nadu. Despite these efforts, the desired results have not been achieved. The investments have not brought in expected growth, and the sector continues to face stagnation. Even with heavy financial inputs, such as Rs 54.20 crores spent in Karnataka, Rs 47.13 crores in Andhra Pradesh, and Rs 16.57 crores in Tamil Nadu in the year 1994-95 alone, the overall impact has been disappointing. From 1989-90 to 1996-97, a total of Rs 750 crores was spent on the NSP project, averaging Rs 25,489 per hectare over a span of seven years, but the long-term effects have not lived up to expectations.The tasks of the sericulture-related institutions at the state and at the central government levels are crucial. Mainly the agencies have to give priority to solve the above problems and later, should concentrate on rectifying the problems in the sericulture industry. The policy initiatives taken up during the post-liberalization phase have clearly not resulted in sustaining the growth trends in the industry. If corrective steps are not initiated in time we stand to lose on two counts, namely, that the investments made under the NSP and other programmes would yield extremely poor returns. Secondly, the share of export earnings of this important commodity will decline not so much due to increase of exports of other products but mainly due to the industry-specific bottlenecks.

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