

## **Sericulture: An Alternative Source of Income to Enhance the Livelihood of Farmers**

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### **Abstract**

Sericulture stands as a vital labor-intensive agricultural sector, offering not only attractive revenues to the farming community but also serving as a consistent cash crop throughout the year in tropical regions. Silk, known as the 'Queen of Textiles', is distinguished by its unparalleled elegance, natural sheen, color affinity, lightweight feel, soft texture, and remarkable durability, making it a textile of worldwide renown. Furthermore, sericulture's characteristics, including its high employment potential, low capital requirements, and profitable production, make it a viable livelihood option for millions. The industry's rural-based activities, both on-farm and off-farm, contribute significantly to employment generation, capturing the attention of planners and policymakers. Farmers who have ventured into sericulture view it as a promising alternative or supplementary income source to traditional crops. The government is now actively endorsing sericulture and implementing effective policies in this sector, fostering optimism among farmers, especially smallholders and marginal farmers, in numerous regions. This study highlights the development of sericulture, Constraints faced by sericulturists, Government schemes and supports, and how sericulture provides an alternative source of income for Farmers in Kolar District in Karnataka.

**Keywords:** Income, Sericulture, Livelihood, Karnataka, Employment

### **1. Introduction**

Sericulture, the cultivation of silkworms for raw silk production, plays a pivotal role in rural economies, particularly in countries like India. This agro-based industry involves nurturing silkworms that spin cocoons, from which raw silk yarn is derived. The process

encompasses food-plant cultivation for silkworm sustenance and cocoon reeling for silk filament extraction, facilitating value addition through processing and weaving.

Notably, sericulture serves as a robust source of employment, employing approximately 60 lakh individuals in India. The industry's employment potential is exceptional, with an estimated generation of 11 man-days of work for every kilogram of raw silk produced, encompassing both on-farm and off-farm activities. This employment boon is especially vital for rural areas, making sericulture a potent tool for rural reconstruction.

Mulberry silk, the primary commercial silk type, originates from domesticated *Bombyx mori* L. silkworms that exclusively feed on mulberry leaves. In India, Karnataka, Andhra Pradesh, West Bengal, Tamil Nadu, and Jammu & Kashmir contribute 92% of the country's mulberry silk production.

Tasar silk, less lustrous but unique, derives from *Antheraea mylitta* silkworms feeding on Asan and Arjun plants. It's produced mainly in Jharkhand, Chhattisgarh, Orissa, Maharashtra, West Bengal, and Andhra Pradesh, sustaining tribal communities.

## **2. Background of The Study**

Silk has been intermingled with the life and culture of the Indians. Though India is producing all the varieties of silk i.e., dress materials, scarves/stoles, readymade garments, etc., the silk sarees are unique. The saree is almost synonymous with the word silk. It is the traditional costume of Indian women since time immemorial. There are innumerable references in Indian literature about this draped garment and the style of wearing differs from time to time, region to region, and people to people. The silk sarees of India are among the living examples of the excellent craftsmanship of the weavers of the country. The artistic and aesthetic sense of Indian weavers is not content with the striking colors they choose for the fabrics but lies in their mastery over the creation of floral designs, beautiful textures, fine geometry, and the durability of such work. The weaver not only weaves with yarn but with intense feeling and emotion. In India, there are several silk weaving centers spread all over the country, known for their distinct and typical style and products. For Indians, particularly ladies, silk is a lifeline - the elixir. Silk is always woven interwoven with the way of life and culture of a region. Craftsmen all over the Indian sub-continent tried to master the weaving of sarees as exclusively as one can think of, putting motif designs, colors, patterns, and versatility in them. No two sarees can be of the same design left to the choice of weaver, thus there are innumerable patterns or diversity. Over the years, specific centers sprung and developed to promote

a particular pattern of design/weaving and they became distinct. Some of the famous silk centers in India are indicated in the table:

**Table 1: Silk Centers in India**

State	Silk Centre
Andhra Pradesh	Dharmavaram, Pochampalli, Venkatagiri, Narainpet
Assam	Sualkuchi
Bihar	Bhagalpur
Gujarat	Surat, Cambay
Jammu & Kashmir	Srinagar
Karnataka	Bangalore, Anekal, Ilkal, Molakalmuru, Melkote, Kollegal
Chhattisgarh	Champa, Chanderi, Raigarh
Maharashtra	Paithan
Tamil Nadu	Kanchipuram, Arni, Salem, Kumbakonam, Thanjavur
Uttar Pradesh	Varanasi
West Bengal	Bishnupur, Murshidabad, Birbhum

(Source: Ministry of Textiles GOI.)

**Table 2: Global Silk Production**

Particulars	China	India	Uzbekistan	Vietnam	Thailand	Brazil	Others	Total
2008	98620	18370	771	-	1100	1177	359	120396
2009	84000	19690	780	-	665	811	224	106170
2010	115000	21005	940	550	655	770	238	139158
2011	104000	23060	940	500	655	558	573	130286
2012	126000	23679	940	450	655	614	572	152910
2013	130000	26480	980	475	680	550	572	159737
2014	146000	28708	1100	420	692	560	578	178058
2015	170000	28523	1200	450	698	600	602	202073
2016	158400	30348	1256	523	712	650	623	192512
2017	142000	31906	1200	520	680	600	601	177507
2018	120000	35468	1800	680	680	650	577	159855

2019	68600	35820	2037	795	700	469	690	109111
2020	53359	33770	2037	969	520	377	733	91765
2021	46700	34903	2037	1067	503	373	728	86311
%	54.11	40.44	2.36	1.24	0.58	0.43	0.84	100.00

Source: [www.inserco.org](http://www.inserco.org)

From Table 2, it can be seen that the world's raw silk production has been increasing steadily from the year 2008 and peaked at 202073 MT in 2015. Then it started declining and presently the silk production (2021) is 86311 MT. This is mainly due to the decline of silk production in China. In India, Sericulture traditionally is practised in tropical environmental regions such as Karnataka, Tamil Nadu, Andhra Pradesh, West Bengal, and to a limited extent in the temperate region of Jammu & Kashmir. These five major mulberry silk-producing states collectively account for more than 80% of the total area under mulberry cultivation and 97% of raw silk production in the country. Tasar silk is mostly produced in the states of Jharkhand, Madhya Pradesh, and Chhattisgarh, while the major portion of Eri & Muga silk production comes from the Northeastern States of Assam, Meghalaya and Nagaland.

### 3. Scope of the Study

Moreover, sericulture enriches rural economies by funneling income back into villages. A substantial 57% of the gross value of silk fabrics returns to cocoon growers. The distribution of income within the sericulture production and trade chain further benefits various stakeholders, with cocoon growers receiving 56.8%, reelers 6.8%, twistors 9.1%, weavers 10.7%, and traders 16.6%.

This agro-based venture offers quick returns with relatively short gestation periods. A modest investment of Rs. 12,000 to 15,000 per acre, excluding land and rearing space costs, can sustain mulberry cultivation and silkworm rearing. Mulberry's rapid growth, which took just six months to commence, supports continuous silkworm rearing for 15-20 years, depending on management inputs. In tropical conditions, five crops can be harvested annually, potentially yielding farmers a net income of up to Rs. 30,000 per acre per year.

#### **4. Importance of the Study**

Silk and sandalwood are unique to Karnataka. Sericulture is a tradition in Karnataka, and culturally, the state accords great value to silk. It is a fascinating story of soil, silk, and fabric. Sericulture flourished under the royal patronage of Tippu Sultan and the Wodeyar's, the Mysore Royal family in the Mysore Kingdom. Sericulture is the rearing of silkworms coupled with mulberry cultivation and reeling for the production of raw silk, and it has been practiced in the state for the last 250 years. This is a farm-based, labour-intensive, and commercially attractive economic activity falling under the cottage and small-scale sectors. Sericulture has been successful in eradicating rural poverty, resulting in social as well as economic development, mainly in rural areas. Sericulture once considered a subsidiary occupation in the past, is now being considered an independent main vocation. Farm and non-farm activities create employment for 60–70 lakh people every year, mostly in rural India. Sericulture offers the scope of transferring wealth from high-income and urban customers to farmers and artisan classes. Rural employment generation and inclusive development are readily addressed by sericulture, which is a significant rural transformation sector. 60% of the work in sericulture is done by women, and sericulture plays a key role in rural women's empowerment. In several districts of the state, sericulture is the mainstay and livelihood of small, marginal farmers, weaker sections of society, and traditional sources of livelihood. Sericulture and silk industries are important sectors of employment for nearly 12 lakh households in Karnataka. Karnataka is the leading raw silk-producing state in the country, contributing about 43% of the country's mulberry silk production. During 2022–23, against a target of 12750 MT, the state produced 11823 MT. It is a commercial crop capable of generating more income than many other commercial crops. Karnataka is well-known for its Mysore silk saris.

#### **Sericultural Highlights of Karnataka**

1. Mysore Silk is registered as a geographic indicator under intellectual property rights.
2. Mulberry raw silk production of 1191 MT in 2021–22 accounted for 43% of the country's total mulberry silk production and was the highest among all other silk-producing states.

#### **Sericulture Areas in Karnataka**

1. Traditional Pockets: Kolar, Chickballapur, Ramanagara, Mandya, Mysore, Chamarajanagar, Bangalore Rural, and Tumkur districts.
2. Non-Traditional Pockets: Chitra Durga, Haveri, Belgaum, and Dharwad districts.

### Sericulture Districts

Sericulture is mainly concentrated in the southern Karnataka districts of Kolar, Chickballapur, Ramanagara, Mandya, Mysore, Chamarajanagar, Bangalore Rural, and Tumkur. Sericulture is also practiced in Chitra Durga, Haveri, Belgaum, and Dharwad districts.

### Reeling Clusters

Kolar, Siddlaghatta, Ramanagara, Kanakapura, Kollegal, T.Narasipura, Channapatna, Shirahatti, and Haveri

### Weaving Clusters

Doddaballapur, Molakalmuru, Gadag-Betageri, and Ilkal

### Silk Production Trends in Karnataka

**Table 3: Year-wise Mulberry Plantation & Raw Silk Production**

Particulars	2018-19	2019-20	2020-21	2021-22	2022-23 (P)
Mulberry Plantation (ha)	104578	106384	107472	108019	112658
Bivoltine	2067	2016	2251	2438	2678
Cross Breed	9525	9127	9041	8753	9145
Mulberry Silk Total (MT)	11592	11143	11292	11191	11823

(Source: sericulture.karnataka.gov.in)

**Table 4: Sericulture Infrastructure as of 2021-22**

Particulars	No.
Sericulture Villages	11470
Sericulture Families/Farmers	138306
Sericulture Reelers	7272
Mulberry Nurseries	227
Chawki Rearing Centres	193
Licensed Silkworm Seed Production Centre (CSB+Pvt+State)	455
Registered Seed Farmers	10005

Commercial Seed Production Centre	39
Technical Service Centre	246
Cocoon Markets	55
Silk Exchanges	10
Number of Charka (Units/Devices)	1695/4504
Number of Cottage Basin (Units/Devices)	5251/18597
Number of Multi-end (Units/Basins)	241/2242
Number of Automatic Reeling (Units/Ends)	32/12800
Number of Automatic Dupion reeling (Units/Ends)	5/710

(Source: sericulture.karnataka.gov.in)

## 5. Review of Literature

The writing on sericulture financial matters envelops different considerations conducted over diverse locales of India, centering on components such as fetched investigation, benefit, imperatives, and showcasing viewpoints. This writing audit gives experiences into the challenges and openings confronted by sericulture agriculturists and partners. Jagannathan (1995) distinguished a few imperatives experienced by sericulture agriculturists within the Coimbatore area of Tamil Nadu. These imperatives included lacking advertising offices, the need for control measures for silkworm infections, labor deficiency for leaf picking, high wage rates, and the non-availability of disease-free layings. Chandrappa et al. (2001) conducted a cost-returns investigation comparing shoot nourishing and rack-raising strategies of mulberry cocoon generation in Karnataka. They found that shoot bolstering had lower starting speculation and repeating consumption compared to rack raising, coming about in higher net returns and return on the venture. Rao et al. (2001) inspected the comparative financial matters of cocoon generation in coastal and conventional zones of Andhra Pradesh, highlighting the variety in taking a toll, abdicate, and income between the two districts. They suggested reinforcing showcasing frameworks in unused regions to make strides in the reasonability of sericulture ventures. Umesh et al. (2001) watched the financial execution of mulberry cocoon generation beneath diverse strategies in Karnataka. They found that shoot bolstering caused lower costs and higher returns compared to rack raising, emphasizing the significance of cost-effective raising strategies. Hiriyanna et al. (2002) assessed the financial matters of distinctive cocoon crossovers, appearing that even though CSR crossovers caused higher costs, they had way better benefit-cost proportions compared to other half-breeds. Gururaj et al. (2007) detailed expanded cocoon yields and returns after agriculturists exchanged to progressed crossbreeds, demonstrating the potential for higher productivity through mechanical intercessions.



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Lakshmanan and Geetha (2007) highlighted the work openings in sericulture, especially for female laborers, compared to other crops, emphasizing the socio-economic importance of the sericulture division. Surinarayanan and Tamilselvi (2007) recognized imperatives confronted by sericulturists in Tamil Nadu, counting labor costs, water supply issues, bother assaults, and showcasing challenges, underscoring the requirement to focus on mediations. Kumaresan et al. (2008) illustrated the benefit of large-scale sericulture cultivating in Tamil Nadu, proposing the requirement for mechanization to address labor deficiencies. Mallikarjuna et al. (2008) analyzed the financial practicality of sericulture compared to other crops beneath rainfed conditions, emphasizing the moderately moo-promoting costs related to sericulture. Srinivasa et al. (2008) detailed the toll of cocoon generation and wage levels of sericulturists in Karnataka, highlighting the significance of edit determination and administration hones in maximizing returns. Dar et al. (2009) recognized imperatives confronted by silkworm rearers in Kashmir, counting restricted mulberry development and post-harvest challenges, demonstrating the requirement for framework advancement and innovation exchange. Munikrishnappa et al. (2009) inspected the financial matters of sericulture in drought-prone locales, highlighting the strength of sericulture to antagonistic climatic conditions. Purushotham and Rao (2009) assessed the financial matters of sericulture in Andhra Pradesh, emphasizing the commitment of labor and hardware costs to add up to generation costs. Borkar et al. (2011) considered the financial matters of sericulture in Maharashtra, highlighting the significance of labor and generation scale in deciding productivity. Shukla (2011) distinguished imperatives within the selection of prescribed innovations in Rajasthan, emphasizing the requirement for reasonable inputs and foundation improvement. Susikaran and Philip Sridhar (2013) surveyed the financially reasonable zones for sericulture in Tamil Nadu, highlighting the productivity of sericulture in particular districts. Siddappaji et al. (2014) talked about the socio-economic advancement potential of sericulture in India, emphasizing its part in the work era and provincial improvement. Manjunatha et al. (2017) assessed cocoon generation and benefits in Karnataka, highlighting the significance of taking a toll on administration and innovation appropriation. Nadarge et al. (2017) analyzed the financial matters of sericulture development in Maharashtra, emphasizing the productivity of mulberry development and cocoon generation. Vikalp Sharma et al. (2019) inspected speculation and return designs in cocoon generation in Himachal Pradesh, emphasizing the requirement for innovative mediation to move forward benefits. Choudhari et al. (2020) distinguished limitations confronted by sericulture makers in Maharashtra, emphasizing the significance of advertising frameworks and transportation offices. Anil Kumar et al. (2022) evaluated cocoon generation and productivity in Northeastern Karnataka, highlighting the part of labor



and input costs in deciding returns. Elumalai et al. (2022) examined promoting and esteem expansion within the silk industry in Tamil Nadu, emphasizing the requirement for quality control and foundation improvement. Harish Kumar (2023) inspected the challenges confronted by ladies in cocoon showcasing exercises, highlighting the requirement for gender-sensitive mediations and back frameworks.

## 6. Objectives

Sericulture is an agro-based industry. The sericulture and silk industries have high employment potential, which is very important for developing countries like India. It is estimated that sericulture can generate employment at 11 man-days per kg of raw silk production (in on-farm and off-farm activities) throughout the year. This potential is par excellence, and no other industry generates this kind of employment, especially in rural areas.

A large portion of income goes back to the villages from the cities. It is estimated that about 57% of the gross value of silk fabrics flows back to the cocoon growers. Sericulture is one of the agro-based activities where the gestation period is quite short while the returns are high. Mulberry takes only six months to grow for the commencement of silkworm rearing. Mulberry, once planted, will go on supporting silkworm rearing year after year for 15–20 years, depending on the inputs and management provided. Five crops can be taken in one year under tropical conditions.

Keeping in view the above, this study was proposed and approved by the concerned authorities with the broad objective of studying sericulture in depth, which provides an alternative source of income for farmers. The specific objectives of the study are:

1. To study the development of sericulture and the constraints faced by sericulturists in Kolar district.
2. To document the support provided to the sericulture sector by the government.
3. To assess the alternative employment opportunities of farmers in Kolar district.

## 7. Research Methodology

Karnataka is the leading state in the country in the field of mulberry sericulture in terms of cocoon and raw silk production. Within the state, Kolar is one of the leading districts in sericulture; hence, this district has been selected purposefully to conduct this study. Relevant secondary and primary data were collected for the study.

## Secondary Data

Secondary data was required to study the sericulture development, marketing structure, and government support schemes in Kolar district. For this purpose, secondary data pertaining to infrastructure, market information, and schemes implemented by the Sericulture Department was collected during April–June 2023 from the following sources:

1. Office of Assistant Director, Department of Sericulture, Govt. of Karnataka, Kolar
2. Government Cocoon Market, Kolar
3. Websites
4. Department of Sericulture, Govt. of Karnataka
5. Central Silk Board, Ministry of Textiles, Govt. of India
6. International Sericultural Commission, United Nations Organization

## Primary Data

A sample survey was conducted in Kolar districts of Karnataka state. A questionnaire was developed for this purpose, and a random sampling method was adopted to identify respondents for the survey. Primary data was collected from the sericulturists to understand the sericultural practices followed at the field level, the schemes availed by them, and the constraints faced by them. The survey was conducted from January to June 2023, and the sample size was 100 farmers. The data collected was compiled for further analysis.

Both primary and secondary data were compiled, and tabulated, and simple analysis, viz., averages, percentages, etc., was performed to meet the objectives of the study.

## Samplings

Sampling is an important aspect of research and data collection in sericulture (silk farming). The study was descriptive and used both primary and secondary data. The purposive sampling frame was used, and the survey method was adopted for the study. Accordingly, five taluks of Kolar district were selected. The names of the taluks are Bangarpet, Kolar, Malur, Mulbagal, and Seinivasapura. From each of the taluks, five villages are selected randomly.

The sampling frame is as follows:

Total Number of Districts = 1

Total Number of Taluks = 5

Total sample respondents:  $4 \times 20 = 100$

### Data Collection Tools

To gather information from sericulture farmers, consider using data collection tools like structured questionnaires, interviews (face-to-face or telephonic), and on-site observations. Questionnaires offer quantitative and qualitative insights, interviews provide in-depth details, and observation supplements the data with real-time farming practices and infrastructure assessment.

### Selection of the District

The population of the study includes sericulture farmers in the Kolar district of Karnataka.



Kolar district, located in the southeastern part of Karnataka, consists of five taluks: Kolar, Bangarpet, Srinivasapura, Malur, and Mulbagal. Known as the "Golden Land" due to Kolar Gold Fields, it excels in horticultural crop productivity and yield. With a GDDP of Rs. 6,182 crores in 2012-13, the district exhibits a vibrant agricultural base, making it favorable for food processing and agro-based industries. Notably, Kolar leads in horticultural crop productivity and cocoon yield. The district boasts cold storage facilities and an operational food park. It also excels in milk production, mulberry

cultivation, and has a horticulture college. Population-wise, Kolar ranks among the top districts in Karnataka, and its literacy rate is above 74 per cent.

## 8. Results and Discussion

**Table 5: Area under Mulberry in Kolar District**

Unit: Ha

SlNo	Taluk	2017-18	2018-19	2019-20	2020-21	2021-22
1	Kolar	7351	7664	7503	7350	7202
2	Bangarpet	2960	3222	2163	2138	2116
3	KGF	-	-	1178	1147	1169
4	Malur	1622	1803	1852	1828	1824
5	Mulbagal	3555	3720	3834	3756	3672
6	Srinivaspur	3302	3527	3462	3398	3346
	Total	18790	19936	19992	19617	19329

(Source: Department of Sericulture Kolar District, Karnataka.)

In Kolar district, 18557 farmers in 1477 villages are practicing sericulture in an area of 19249.80 hectares (48125.10 acres). Among them, 1828 are scheduled castes, 881 are scheduled tribes, and 1250 are women farmers. For the years 2021-22, V-1 mulberry variety expansion has been undertaken, covering an area of 688.44 hectares, by adopting new technologies. During the year, 109.205 lakh crossbred DFLs were brushed, 7247 MTs of crossbred cocoons were produced, 20.280 lakh bivoltine DFLs were brushed, and 1187.875 MTs of bivoltine cocoons were produced. CSR bivoltine and Kolar Chinna hybrids are very popular. Among the mulberry varieties, V-1 and S-36 played an important role in increasing mulberry leaf production. In order to encourage sericulture, several schemes have been dove-tailed, like the District Sericulture Development Scheme, the New Katrirtva Shakti and Stakeholder Privilege Scheme, State Silk Development Scheme, Silk Comprehensive Scheme (General/Special Unit Scheme/Girijan Sub-Scheme), Drip Irrigation under the Centrally Awarded Pradhan Mantri Krishi Sinchai Yojana (PMKSY), District Zilla Panchayat, and Taluk Panchayat programs Scheduled Caste or Scheduled Tribe Special privileges have been provided to women and small or micro farmers. Mulberry leaf from the mulberry crop is food for silkworms. The quality and quantity of the mulberry leaves determine the quality, productivity, and production of silkworm cocoons produced in an area. Earlier, most of the area under mulberry cultivation was under local varieties, but now, due to the R&D efforts of the state and central research organizations, high-yielding, improved-quality mulberry varieties have come to fields like V-1, S-36, etc., which helped farmers realize higher returns per unit area. The area under mulberry cultivation in all the taluks in Kolar district is given in the table below.

**Table 6: Production of Cocoons in Kolar District**

Unit: MT

CB: Cross Breed; BV: Bivoltine

Particulars		Kolar	Bangarpet	KGF	Malur	Mulbagal	Srinivasapur	Total
2017-18	CB	4370	1467	-	1067	1550	1188	9642
	BV	306	496	-	245	136	125	1308
	Total	4676	1963	-	1312	1686	1313	10950
2018-19	CB	3412	1234	-	876	1223	920	7665
	BV	392	455	-	224	182	105	1358
	Total	3804	1689	-	1100	1405	1025	9023
2019-20	CB	4767	1001	500	748	1475	1207	9698
	BV	325	442	185	258	176	52	1438
	Total	5092	1443	685	1006	1650	1259	11136
2020-21	CB	3867	938	458	820	1355	1322	8759
	BV	304	412	140	212	185	50	1303
	Total	4171	1350	598	1032	1541	1371	10062
2021-22	CB	3351	775	396	750	1299	1265	7836
	BV	335	385	124	248	208	55	1355
	Total	3686	1160	520	998	1507	1320	9191

(Source: Department of Sericulture Kolar District, Karnataka.)

Kolar district has been one of the traditional sericulture-practicing areas in Karnataka state. Hence, the majority of the farmers have been practicing CB sericulture, producing high-quality CB cocoons. The demand for CB silk (multivoltine or yellow silk) is quite high in the country, catering to the demand of the handloom sector. CB cocoon production forms about 85% of the total production of the district. The total cocoon production in Kolar district has shown a declining trend for the past 3 years, from 11136 MT during 2019–20 to 9191 MT in 2021–22. It may be due to the COVID-19 pandemic during this period (Fig 24). The taluk-wise cocoon production figures are shown in Fig. 25. CB cocoons form the major portion of cocoon production in all the taluks of the district.

### Constraints Faced by Sericulture Farmers

Labor deficiency remains a noteworthy challenge within the sericulture division, with 70% of respondents in a study of 100 ranchers citing it as a major limitation. Whereas

labor-saving innovations have been presented, little ranchers depending on family labor admission way better than bigger ones dependent on contracted labor. In spite of this, showcasing cocoons is by and large not risky, with 95% of ranchers communicating fulfillment with the showcasing framework in Karnataka, particularly in Kolar area. Government back, counting specialized direction and plot usage, has been well-received, with 95% of agriculturists recognizing its viability. Karnataka brags a strong promoting framework for sericulture, with government-regulated cocoon markets guaranteeing reasonable costs through open and e-auctioning forms. Electronic weighing and installment frameworks upgrade proficiency, with 90% of exchanges presently conducted electronically. These endeavors have made strides in straightforwardness and given a boost to both rearers and reelers within the silk industry.

**Table 7: Govt. Cocoon Markets in Karnataka**

Sl No	District	Taluk	Sl No	Name of Market
1	Bangalore Rural	Devanahalli	1	Vijayapura
2	Bagalakote	Mudhol	2	Mudhol
		Hundgund	3	Ilkal
3	Belagavi	Athani	4	Athani
		Gokak	5	Gokak
4	Ballari	Kudligi	6	Kudligi
5	Bidar	Humnabad	7	Humnabad
6	Vijayapura	Vijayapura	8	Vijayapura
7	Chamarajanagar	Chamarajanagar	9	Chamarajanagar
		Chamarajanagar	10	Santhemarhalli
		Chamarajanagar	11	Harave
		Kollegala	12	Kollegala
		Kollegala	13	Hanur
8	Mysuru	Mysuru	14	Mysuru
		T Narasipura	15	T Narasipura
9	Chikkaballapura	Chikkaballapura	16	Chikkaballapura
		Chintamani	17	Chintamani
		Sidlaghatta	18	Sidlaghatta
		Sidlaghatta	19	H Cross
10	Dakshina Kannada	Bantawala	20	B C Road
11	Davanagere	Davanagere	21	Davanagere

12	Dharwad	Dharwad	22	Rayapura
13	Gadag	Shirahatti	23	Shirahatti
14	Gulbarga	Gulbarga	24	Gulbarga
		Jevargi	25	Jevargi
15	Kolar	Kolar	26	Kolar
		Kolar	27	Kyalanur
		Srinivasapura	28	Srinivasapura
		Mulbagal	29	Mulbagal
16	Mandya	Malavalli	30	Malavalli
17	Ramnagara	Ramnagara	31	Ramnagara
		Channapatna	32	Channapatna
		Kanakapura	33	Kanakapura
18	Raichur	Lingasugur	34	Lingasugur
19	Haveri	Haveri	35	Haveri

(Source: Department of Sericulture Kolar District, Karnataka.)

From the table, it can be seen that the cocoon markets have been established across the length and breadth of the State covering all the sericulture areas. Kolar district has 4 cocoon markets in the important sericulture taluks of the district.

Kolar cocoon market is the largest cocoon market in the district transacting a major portion of the cocoons produced in the district. The cocoon transaction details of the Kolar market are given in the table below.

**Table 8: Details of Cocoon Transactions of Kolar Market**

Year	Type of cocoon	No. of Lots	Transaction Qty (MT)	Value (Cr. Rs.)	Market Fee (Lakh Rs.)	Cocoon Price (Rs)		
						Max	Min	Avg
2015-16	CB	42259	1762.688	44.19	88.38	428	150	251
	BV	10294	428.857	12.26	24.52	470	130	286
	Total	5254	2191.545	56.45	112.9	470	130	258
2016-17	CB	30343	1338.143	47.24	94.48	540	150	353
	BV	21072	929.297	39.78	79.56	610	130	428
	Total	51415	2267.44	87.02	174.04	610	130	384
	CB	23600	1079.854	43.03	86.06	550	150	398



2017-18	BV	21965	1005.043	49.19	88.39	701	130	489
	Total	45565	2084.897	92.22	184.44	701	130	442
2018-19	CB	30886	1358.293	38.72	77.44	665	100	285
	BV	18025	1154.292	39.68	79.36	550	100	344
	Total	48911	2512.565	78.4	156.8	665	100	312
2019-20	CB	22902	1006.182	33.04	66.09	501	130	328
	BV	13337	867.668	35.69	71.78	625	120	414
	Total	36239	1873.85	68.93	137.87	625	120	368
2020-21	CB	12368	585.896	15.34	30.70	436	123	262
	BV	13539	959.729	29.13	58.27	541	120	304
	Total	25307	1545.625	44.47	88.97	541	120	288
2021-22	CB	11939	1026.813	52.11	104.23	807	123	416
	BV	13902	575.25	23.93	47.85	999	120	508
	Total	25841	1602.062	76.04	152.08	999	120	508

The total number of cocoons lots transacted, including bivoltine and crossbreed, in the Kolar market during the past 7 years, is shown in Fig 31. The number of cocoons lots transacted over the years has been declining, from a peak of 52533 in 2015-16 to a low of 25307 in 2020-21. In line with this, the quantity of cocoons transacted has been declining over the past 4 years, from 2512.57 MT in 2018-19 to 1602.06 MT in 2021-22. The drop in cocoon transactions (no. of lots & quantity) may be due to the stoppage of cocoons coming from neighboring states. Government back for the sericulture segment is vital for improving efficiency and progressing the employment of little and negligible ranchers. With around 13 to 14 lakh families specifically subordinate to sericulture in Karnataka, the government plans to play a crucial part in advancing mechanical progressions and quality improvement. Investigate education and colleges create inventive innovations, but small-scale ranchers frequently need assets to receive them. In this manner, government intercessions encourage the exchange of these advances to the field. Central and state governments execute different plans to empower logical sericulture hones, pointing to boost quality, efficiency, and agriculturist earnings. These endeavors are fundamental for supporting the sericulture industry and supporting country vocations.

**Table 9: State Sericulture Development Programme**

Sl no	Particulars	Unit Price (Rs)	Total Subsidy (Rs)	Remarks
<b>1</b>	<b>Subsidy for Construction of Rearing Houses</b>			
i	1000 sq. ft.	400000	75%: 300000	1.20 acre and must be a bivoltine rearer
ii	600 sq. ft.	300000	75%: 225000	1 acre and 2 bivoltine crops
iii	225 sq ft	90000	75%: 67500	0.20 acre and 1 bivoltine crop
iv	low cost 225 to 1000 sq. ft.		Prorata basis	100/- per sq ft
2	Subsidy for purchase of rearing equipment	75000	75%: 56250	1.00 acre and 1 bivoltine crop
<b>3</b>	<b>Subsidy for Construction of the mounting hall</b>			
i	1800 Sq ft	50000		should have 3.00 acre mulberry
ii	1500 Sq ft	45000		should have 2.25 acre Mulberry
iii	1250 Sq ft	37500		should have 2 acres of Mulberry
iv	1000 Sq ft	30000		should have 1.2 acres of mulberry
v	600Sq ft	18000		should have 1 acre of mulberry
4	Subsidy for chawki worm plantation / Construction of chawki rearing building and purchases of equipment			
	Chawki plantation management, chawki rearing building and purchase of equipment	1200000	75%: 900000	Minimum 2 acres chawki garden - own/leased. Annual bivoltine brushing capacity 1.50 to 1.60 lakh DFLs

(Source: Department of Sericulture Kolar District, Karnataka.)

**Table 10: Central Sponsored Silk Samagra Scheme**

#	Particulars	Unit Price (Rs)	Total Subsidy (Rs)	Remarks
1	Subsidy for construction of rearing house			
i	1000 Sq. ft.	40000	90%:	1.2 acre only bivoltine

		0	360000	farmers
ii	6000 Sq. ft.	300000	90%: 270000	1 acre & 2 bivoltine crops
iii	225 Sq. ft.	90000	90%: 81000	0.20 acre & 1 bivoltine crop
iv	Low cost 225 to 1000 Sq. ft. based on pro rata basis @ Rs 120 per Sq. ft.			
2	Subsidy for purchase of rearing equipment's	75000	90%: 67500	1 acre & 1 bivoltine crop

(Source: Department of sericulture Kolar District, Karnataka.)

**Table 11: Pradhana Mantri Krishi Sinchai Yojana (PMKSY)**

#	Particulars	Unit price (Rs)	Subsidy (Rs / Ha)	
1	Implementation subsidy for drip-irrigated mulberry plantation	975 98	General 75% = 73,198/-	SC / ST 90% = 87.838/-

Note: In all the above schemes, 3% is for disabled & 33% is for women.

(Source: Department of Sericulture Kolar District, Karnataka.)

**SILK SAMAGRA** - An Integrated Scheme for Development of Silk Industry (ISDSI). The "Silk Samagra-Integrated Conspire for Improvement of Silk Industry (ISDSI)" may be a comprehensive activity by the Government of India, encouraged through the Central Silk Board (CSB), with an added up to budget of Rs. 2161.68 crore for three a long time (2017-20). It points to boosting the Silk Industry's improvement, progressing quality and efficiency. The plot comprises four primary components: Inquire about & Improvement, Seed Organizations, Quality Certification/Brand Advancement, and Recipient Situated Components. It centers on improving plant assortments, seed generation, quality certification, and supporting different sericulture exercises, especially profiting financially distraught tribal families, counting ladies. Women's self-help bunches play a pivotal part, in engaging marginalized communities and making strides in their living guidelines.

## Alternative Employment Opportunities of Sericulture Farmers

Sericulture (mulberry cultivation & silkworm rearing) is a cash/commercial crop, where the gestation period is quite low while the returns are high. An estimated investment of Rs. 12,000 to 15,000 (excluding cost of land and rearing space) is sufficient for undertaking mulberry cultivation and silkworm rearing in einem acre of irrigated land. Mulberry takes only six months to grow for the beginning of silkworm rearing. Mulberry, once planted, will go on supporting Silkworm rearing year after year for 15-20 years, depending on inputs and management provided. Five crops can be taken in Einem Jahr under tropical conditions. By adopting the stipulated package of practices, a farmer can attain net income levels up to Rs. 30000 per acre per annum. Hence, sericulture is quite competitive when compared to several other crops, viz., vegetable, fruit and flower crops, cultivated in the district.

There are several other business opportunities in the sericulture industry, apart from the production of silk cocoons, which are listed in the table below:

**Table 12: Business Opportunities in Sericulture Industry**

Sl No	Business Opportunities	Details
I.	<i>Pre cocoon activity</i>	
1.	Kisan Nursery	Multiplication of improved mulberry varieties for new plantation
2.	Production of Biofertilizers	Application to mulberry garden – saves money & improves soil fertility
3.	Compost / Vermicompost production	Application to mulberry garden – rich in micronutrients & improves soil fertility
4.	Production of disinfectant chemicals	Used in silkworm rearing to protect silkworms from disease-causing organisms
5.	Production of bio-control agents	To protect mulberry as well as silkworm crops from natural enemies
6.	Production of rearing equipment including moutages	For use in silk cocoon crop

7.	Preparation of garlands / flowers and greeting cards form waste cocoons	Great economic value and value addition
8.	Pupa oil / powder extraction	Used in detergents and animal feeds manufacturing
9.	Bivoltine Silkworm Rearing	Serves as a raw material for producing quality silk
10.	Production of garden and rearing implements	Saves labour – brings in mechanization in sericulture
11.	Silkworm egg production	Production and supply of quality silkworm eggs
11.	Chawki rearing	Supply of chawki worms – increases the probability of success of the crop
<i>II. Post cocoon activity</i>		
1.	Reeling	Process of extracting raw silk thread from cocoons
2.	Twisting	For strengthening the bave
3.	Weaving	Process of manufacturing fabric
4.	Printing	Designing on plain fabric
5.	Dyeing	Process of colouring the thread / cloth
6.	Computer-aided designing	Production of simulated designs which can be weaved into a saree
<i>III Services</i>		
1.	Mass disinfection of rearing houses	On rental / contract basis
2.	Renting out of the implements and mountages	As most of them are used for a specific time during the crop, most of the farmers are not owning them
3.	Cocoon collection and transportation to the market	Cocoon markets are situated far away from production points & not connected with good roads & timely transport
4.	Distribution of chawki (young age) worms	Refrigerated transport is not available in the private sector for sericulture

(Source: Department of Sericulture Kolar District, Karnataka.)

## 09. Findings

1. The study indicates that mulberry acreage, DFLs (Disease-Free Layings) production, cocoon production, and cocoon yield in the Kolar district have stabilized within a narrow range. This implies that sericulture activity has reached a certain level of stability.
2. To increase cocoon production, it is recommended to expand the area under mulberry cultivation, enhance mulberry and cocoon productivity, and implement other measures aimed at boosting production.
3. The primary constraint faced by sericulture farmers is a shortage of labor, a common issue in rural areas due to the migration of labour to urban areas.
4. The analysis suggests that the marketing system for Sericulture and Silk in Karnataka is well-developed. Cocoon markets are organized efficiently with modern facilities, ensuring transparent transactions for the benefit of industry stakeholders.
5. The study finds that both State and Central Governments provide comprehensive support to sericulture farmers through various schemes that cover all aspects of mulberry cultivation and silkworm rearing. These Schemes aim at improving quality and productivity.
6. Sericulture is competitive compared to other crops like vegetables, fruits, and flowers in Kolar district. There are various business opportunities within the sericulture sector beyond silk cocoon production that can be explored by farmers and entrepreneurs.

## 10. Suggestions

1. Focus on high-quality mulberry cultivation with proper irrigation, fertilization, and pest control measures.
2. Implement clean and hygienic silkworm-rearing practices with adequate ventilation and temperature control.
3. Invest in well-designed rearing houses, cocoon drying facilities, and storage areas to enhance productivity and maintain silk quality.
4. Strive for high-quality cocoon production with uniform size, shape, and color.
5. Stay updated with market trends and potential buyers for Silk Products. Explore value-addition opportunities.
6. Properly prepare the land before mulberry plantation by clearing weeds, improving soil fertility, and ensuring drainage.

7. Collaborate with the local sericulture department to access government schemes, subsidies, and technical guidance.
8. Maintain clean, well-ventilated rearing houses and follow recommended practices for Silkworm rearing.
9. Keep accurate financial records, monitor costs and income, and seek financial advice for informed decision-making.

## 11. Conclusion

The study clearly indicates that sericulture i.e., mulberry cultivation & silkworm rearing, is an important commercial crop in the district, supporting the livelihood of about 20 000 sericulture farmers. Mulberry crop is highly competitive when compared to other commercial crops, viz., vegetable, fruit & flower crops grown in the district.

Since the Kolar district is a traditional sericulture area, the farmers are well aware of the sericultural practices and are open to adopting newer/latest technologies in sericulture. Diese is well supported by the State and Central Govt. Schemes, which help the farmers in terms of investment subsidies for capital-intensive technologies aimed at improving quality and productivity. The sericulture market is well-developed in the district with well-established cocoon markets, catering to the needs of all the stakeholders of the activity.

All the above factors indicate that sericulture is thriving well in the Kolar district and has further scope for expansion, which will create more employment opportunities and simultaneously enhance the incomes of the sericulture farmers.

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