



The Golden Thread: Role of Agricultural Extension in Making Karnataka

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One of the most prized and oldest forms of natural fibre, silk, not only supports rural economies but also symbolizes India's rich cultural heritage. Karnataka, recognized as the silk capital of India, contributes significantly to the country's raw silk production, accounting for nearly one-third of the total output due to its favourable agro-climatic conditions and well-developed agricultural extension system. Sericulture, as an agro-industrial activity, relies on continuous knowledge transfer, institutional support, and technological adoption. This article examines the role of agricultural extension education in the growth of sericulture in Karnataka, focusing on farmer training, participatory approaches, credit facilitation, and market linkages. Based on data from the Central Silk Board and relevant literature, the findings highlight the importance of participatory extension approaches in enhancing productivity and sustaining Karnataka's leading position in silk production.

Keywords: Sericulture, Karnataka, silk production, Silk Samagra, Farmer Producer Organizations.

Introduction

Silk brings together India's history, tradition, and craftsmanship in a way that no other commodity can. Be it the beautiful draping of a Kanchipuram Saree or the rustic look of Bhagalpur Tussar, every fiber of Indian silk carries within it the combined labor of silkworm farmers, reelers, and weavers, and behind them, the invisible hand of agricultural extension services (PIB, 2025, April 11). The commodity has been an integral part of India's cultural and economic landscape for centuries. The country today is the second-largest producer of silk in the world after China and the largest consumer, with the silk industry employing nearly 8.8 million people, mostly women and in rural areas (Central Silk Board, 2023). In this context, Karnataka has been one of the leading states in the country. In 2023-24, Karnataka has been producing as much as 12,463 metric tonnes of raw silk, which is roughly 32 percent of India's total production and nearly 42 percent of India's total mulberry production (PIB, 2025, April 1). The districts of Ramanagara, Mysuru, Tumakuru, and Chikkaballapur are at the heart of this achievement and are synonymous with Mysore silk. This leadership is not solely a result of favourable natural conditions but is strongly rooted in sustained and evolving agricultural extension efforts. Agricultural extension broadly includes all activities that provide farmers with the knowledge, services, and institutional support required to improve their livelihoods through better technical, organizational, and managerial practices (Gunashekhar *et al.*, 2024). In sericulture, this role is particularly significant because the production process involves multiple stages, including mulberry cultivation, silkworm rearing, cocoon production, reeling, and weaving, each requiring specialised skills and timely

interventions. Extension personnel thus act not only as information providers but also as key facilitators linking research institutions with farmers.

In Karnataka, modern extension operates through a well-developed institutional network involving the Department of Sericulture, the Central Silk Board, Krishi Vigyan Kendras, Farmer Producer Organizations, and digital advisory platforms. Each of these institutions contributes to technology dissemination, capacity building, and farmer empowerment. This article examines how these extension systems and policy interventions have collectively shaped the sericulture sector in Karnataka, with a focus on participatory approaches, major schemes, and the growing role of digital extension.

Karnataka: India's Undisputed Silk Capital

A Legacy Built on Mulberry

Sericulture, as a traditional agro-based cottage industry, has long been a vital part of the rural economy of Karnataka. The state has earned fame for the production of 'Mysore Silk,' which is renowned for its softness, sheen, and durability. It has continued to occupy the top position as the highest producer of silk in the country. What makes the case of Karnataka unique is the production of all the four varieties of silk, namely mulberry, tasar, eri, and muga. However, the production of mulberry dominates the others owing to its wide applicability in the production of sarees, dress materials, scarves, etc. (SATHEE, IIT Kanpur, n.d.). In the country as a whole, the production of raw silk has recorded a steady growth from 31,906 metric tonnes during the year 2017-18 to 38,913 metric tonnes during the year 2023-24. This has been achieved through the growth of the mulberry cultivation area from 2,23,926 hectares to 2,63,352 hectares during the same period. (PIB, 2025, April 1). In the context of the state of Karnataka, the state has played a vital role in the production of silk. The districts of Ramanagara, Mysuru, Chikkaballapur, Tumakuru, Kolar, etc., have formed the core of the country's production System.

Socio-economic Significance

Sericulture's importance transcends production statistics. The industry employs approximately 8.8 million individuals in rural and semi-urban areas across India, the majority of whom belong to economically disadvantaged groups, including a substantial proportion of women and youth (GoI, 2022). In Karnataka, rural families rely on silk farming as either a primary or supplementary source of income, making the sector a powerful instrument of poverty alleviation and women's empowerment. Economically, the silk industry functions as a redistributive mechanism: wealth generated by consumers of expensive silk garments flows indirectly to cocoon farmers and raw silk producers in rural areas. This wealth transfer underscores why agricultural extension, which enhances the productivity and income of these rural actors is fundamentally a social equity intervention, not merely a technical one.



Fig. 1: Silk as a cultural tradition — women selecting handwoven silk sarees, reflecting the deep-rooted significance of silk in Indian social and ceremonial life.



Fig. 2: A woman reeling silk thread from softened cocoons

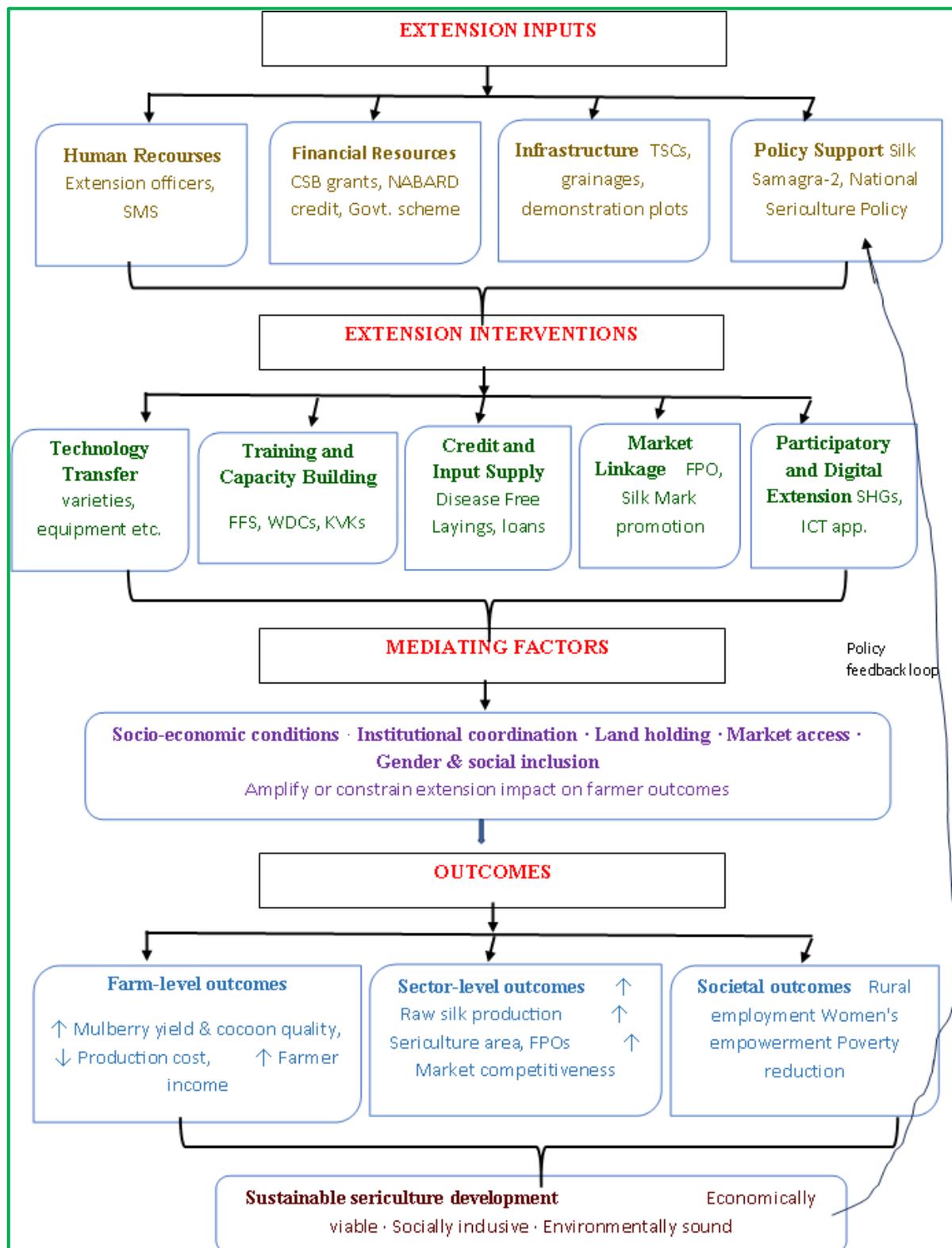


Fig. 3: Conceptual framework: extension interventions to sustainable sericulture outcomes

Agricultural Extension in Sericulture: Functions and Impact

Technology Transfer: From Laboratory to Land

The primary mandate of agricultural extension is the effective transfer of technology, ensuring that research outputs are translated into practical applications that farmers can adopt in their fields. In the context of sericulture, this includes the dissemination of improved mulberry varieties, superior silkworm hybrids, scientific rearing practices, disease management techniques, and modern reeling technologies. Extension personnel act as a vital bridge between research institutions and farm households, facilitating the flow of knowledge and innovation.

Research indicates that extension workers play a key role in identifying farmers' needs and constraints, promoting improved agricultural practices, recommending suitable crop varieties, encouraging technology adoption, and assessing farmers' responses to development interventions (Altab *et al.*, 2015). These functions are especially important in sericulture, where many smallholder farmers rely heavily on extension support due to limited access to formal education and technical resources. In recent years, the philosophy of agricultural extension has undergone a significant transformation. The conventional top-down Transfer of Technology approach has gradually been replaced by more participatory and farmer-centric models that emphasize local knowledge, collaborative problem-solving, and demand-driven services (Kakara *et al.*, 2025). Karnataka's sericulture extension system reflects this shift by actively promoting farmer demonstrations, field days, and group-based learning approaches, making extension more inclusive, interactive, and responsive to farmers' needs.

Training and Capacity Building

Training forms the foundation of sericulture extension, enabling farmers to acquire the skills required for efficient and scientific production. In Karnataka, the research and development institutes of the Central Silk Board have trained around 7,000 individuals over the past three years and the current period (2021–24), covering diverse aspects such as mulberry cultivation, silkworm disease management, and silk reeling. These programmes are delivered through multiple approaches, including classroom teaching, field demonstrations, exposure visits, and hands-on rearing practices. At the grassroots level, Technical Service Centres (TSCs) serve as key knowledge hubs, providing continuous technical guidance to farmers. In Chikkaballapur district, one of the major sericulture regions of the state, 14 TSCs operate at the hobli level, supported by five Assistant Directors at the taluk level. Together, they cater to more than 15,570 sericulture families across 1,131 villages (Chikkaballapur District, 2026). Women's demonstration centres represent another important component of the training system. These centres offer focused training to women in areas such as nursery management, mulberry cultivation, disinfection practices, chawki rearing, silkworm rearing, and disease control. With provisions like stipends and hostel facilities, these initiatives have played a significant role in empowering women to become skilled participants in the sericulture value chain rather than remaining as unskilled labour.

Supply of Inputs and Credit Facilitation

The role of Sericulture Extension Officers (SEOs) goes far beyond conventional training functions. They support farmers in procuring quality mulberry planting materials, fertilizers, and plant protection inputs, while also ensuring the timely supply of Disease Free Layings (DFLs) to sericulturists. In addition, SEOs are responsible for issuing licences to farmers who demonstrate the capacity to produce quality seed cocoons. An equally important aspect of their work involves facilitating access to institutional credit by linking farmers with banks and cooperative institutions, as well as mobilizing community resources to secure government assistance for shared sericulture infrastructure.

This multidimensional role highlights a central principle of modern agricultural extension: successful technology adoption depends not only on the transfer of knowledge but also on ensuring farmers' access to essential resources such as credit, inputs, and infrastructure (Davis & Sulaiman, 2016).

Market Linkage and Value Chain Development

An effective extension system extends beyond the farm gate, following the commodity along the entire value chain to ensure that farmers receive fair and remunerative prices. In Karnataka, a well-established network of regulated cocoon markets, including Class I and Class II markets at Sidlaghatta, Chintamani, and Chikkaballapur, supports this objective. These markets are backed by extension-driven information systems that enable farmers to make informed decisions regarding the timing and sale of their produce.

The Government's Silk Samagra-2 scheme has further strengthened market infrastructure by facilitating the establishment of Automatic Reeling Machines and Multi-end Reeling Machines across the state. These interventions improve the efficiency of converting cocoons

into high-quality raw silk, thereby enhancing value addition. In addition, the scheme promotes silk through branding and marketing initiatives such as the Silk Mark label, organized Silk Mark Expos, and efforts aimed at improving the global competitiveness of Indian silk. (PIB, 2025, April 1).

Policy Architecture Supporting Extension

Silk Samagra-2: A Comprehensive Intervention

The flagship program of the Central Government, "Silk Samagra-2," with an outlay of Rs. 4,679.85 crore for the period from 2021-22 to 2025-26, is the most ambitious policy intervention in the history of sericulture development in India. The program has adopted an integrated approach to sericulture production, offering backward and forward linkages in all aspects of silk production, from planting material and silkworm seeds to market infrastructure and reeling technology. The state of Karnataka has been the largest beneficiary of this program, with central assistance to the tune of Rs. 241.62 crore being sanctioned to cover around 16,000 beneficiaries in the state for the last three years and this year, covering pre-cocoon and post-cocoon activities as well. In addition to ARMs and multi-end reeling machines, this program has sanctioned 40 motorized charkas, 2 pupae processing machines, and upgradation of 143 cottage basins (PIB, 2025, April 1).

Institutional Architecture: CSB, NABARD, and Convergence

The Central Silk Board is the apex body for the development of sericulture in India and has played a major role in strengthening the extension support for the development of sericulture. For example, the Central Silk Board has provided financial support to over 500 sericulture FPOs under the Seri-Plus Scheme and the SERICARE Scheme. Additionally, the NABARD has provided financial and technical support to the development of sericulture through the Rural Infrastructure Development Fund and other credit facilities. For example, it has provided financial support of over Rs. 1,200 crores for the development of sericulture infrastructure. Furthermore, the integration of the initiatives of the Central Silk Board with major government programs like MGNREGS, RKVY, and PMKSY has greatly enhanced the extension support for the development of sericulture. This has resulted in the development of irrigation facilities for over 50,000 hectares of mulberry cultivation, thereby enhancing the productivity and efficiency of the resources (Prem *et al.*, 2024).

Farmer Producer Organizations: Collective Extension in Action

One of the most notable institutional innovations in the sericulture sector of Karnataka has been the promotion of Farmer Producer Organizations. The Karnataka State Sericulture Department has encouraged the development of more than 31 sericulture FPOs, offering these farmers the required subsidies, training, and infrastructure support as per the local conditions. FPOs have been recognized as tools of collective extension, which help farmers strengthen their bargaining positions, gain access to the latest technology, and credit facilities, as well as help them develop better market linkages. FPOs help the farmers aggregate the demands and supply of the farmers, thereby reducing the costs of transactions, which enables the farmers to invest in improving the quality of the sericulture products—a basic requirement to attain premium prices in the local as well as global markets (Gunashekhar *et al.*, 2024).

Challenges Confronting Sericulture Extension

Despite significant progress, Karnataka's sericulture extension system continues to face several critical challenges. Studies indicate that a considerable proportion of extension personnel have limited awareness of key frameworks such as the Agricultural Technology Management Agency (ATMA), while participatory and ICT-based approaches are still not widely adopted in field-level practice (Kareem *et al.*, 2019). Moreover, coordination between the sericulture department and other line departments, including animal husbandry, horticulture, and agriculture, remains inadequate, resulting in fragmented rather than integrated advisory services. Financial limitations restrict the growth and effectiveness of Farmer Producer Organizations, and infrastructural gaps, particularly in cold storage, reeling

units, and grainages, hinder value addition at the farm level. At the same time, climate change is emerging as a serious concern, as increasing temperatures negatively influence mulberry growth and silkworm productivity. These challenges highlight the need for extension systems to move beyond a conventional information-dissemination role and adopt a more proactive approach focused on strengthening farmers' resilience and adaptive capacity.

In addition, the cost of production across major stages, including mulberry cultivation, cocoon production, and silk yarn processing, remains high, reducing farmers' profit margins. Extension efforts must therefore emphasize the promotion of cost-reducing technologies such as drip irrigation, improved mulberry varieties, and mechanized rearing practices, along with facilitating access to supportive policies and input subsidies.

Way Forward: Reimagining Extension for Sericulture

However, the future of the leading position of Karnataka in the silk production sector depends to a great extent on the modernization and expansion of its extension system. The extension personnel must get proper training on the existing approaches to extension services such as participatory approaches, ICT-based tools, and farming systems approaches to enable the sector to transcend the existing commodity-specific and top-down approaches to extension services. Moreover, the agri-entrepreneurship models, where graduates and diploma holders can extend consultancy services and other support to farmers at the grassroots level, have tremendous potential to extend extension services and involve educated youth in the rural areas. Digital extension services must be considered strategically. The mobile-based advisory services and video-based extension services can bridge the gap between formal extension services and the large number of farmers who remain outside the formal extension services. When ICT tools are incorporated into the existing sericulture system of Karnataka, enabling farmers to access information and get early warnings of disease outbreaks, farmers can make better decisions and avoid unnecessary losses.

In the institutional arena, the strengthening of the capacity of sericulture FPOs in the sphere of business management and quality certification is vital (Prem *et al.*, 2024). The establishment of links between sericulture FPOs and e-commerce platforms and premium domestic and export markets would open up new avenues of income generation, which would otherwise be beyond the reach of the farming community. Finally, stronger and more effective linkages between research and extension systems and the farming community are vital in order to ensure the efficient transfer of technology developed in the research institutions of the Central Silk Board to the farming community through a well-coordinated and effective extension mechanism.

Conclusion

The development of Karnataka as the leading producer of silk in India is closely related to the success of agricultural extension. The latter has been crucial in the promotion of improved varieties of mulberry, training that helped subsistence farmers become experts in sericulture, and facilitating access to advanced reeling equipment and market systems. The development of FPOs has helped farmers benefit through improved access to markets. The contribution of sericulture is twofold: it is both a source of livelihood and a means of preserving heritage and women empowerment. To ensure that Karnataka maintains its position as the leading producer of silk in India, it is important to continue strengthening agricultural extension systems. The key driver of this is the agricultural extension system.

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