Vigyan Varta www.vigyanvarta.in

Weaving Technology into Silk: How Digital Tools Are Transforming Sericulture

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Sericulture, Digital Agriculture, ICT in Farming, Rural Empowerment

How to cite this article:

Komal, J., Kumar, P. V. D. and Nadaf, H. 2025. Weaving Technology into Silk: How Digital Tools Are Transforming Sericulture. *Vigyan Varta* 6 (6):108-110.

ABSTRACT

Sericulture, a cornerstone of India's rural economy and cultural legacy, is undergoing a transformative shift through the integration of digital technologies. This article explores how Information and Communication Technology (ICT), Geographic Information Systems (GIS), and mobile applications are revitalizing the silk industry by improving productivity, resilience, and inclusivity. Mobile apps are empowering farmers with real-time data on silkworm rearing and market prices, while GIS tools enhance land-use planning and disease management. ICT platforms foster connectivity, knowledge sharing, and remote training, bridging geographical and educational divides. Beyond productivity gains, these innovations are democratizing access to information, empowering rural women and youth, and ensuring equitable access to government schemes. Together, these digital tools are weaving a smarter, more sustainable, and inclusive future for India's sericulture sector.

INTRODUCTION

A New Thread in the Silk Story

S ilk has long been a symbol of India's heritage, entwining culture, economy, and rural livelihoods. Today, the

ancient practice of sericulture is adopting modernity as digital technologies transform the cultivation and marketing of silk. The emergence of ICT, GIS, and mobile applications has provided farmers with



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technology that is as essential as traditional instruments, thereby enhancing productivity and fostering a more interconnected and resilient sericulture community.

- 1. Empowering Farmers Through Mobile Apps: For decades, many silkworm farmers depended on conventional techniques and regional expertise to manage their harvests and silkworms. This knowledge, however valuable, frequently proves inadequate when farmers encounter climate uncertainties, pest infestations, or variable market pricing. The increasing use of smartphones in rural India has enabled farmers to obtain real-time information, effectively closing the knowledge gap in novel manners. Mobile applications like Silksage, and other localised platforms now function as digital aids for farmers. These applications supply instruction on rearing methodologies, assist in diagnosing silkworm diseases via image submissions, and furnish current cocoon market values (Ghantasala et al., 2024).
- 2. GIS: Mapping **Opportunities** and Managing Risks: Geographic Information Systems (GIS) provide sericulture with a data-driven advantage. Through the analysis of topography, precipitation, soil composition, and temperature, GIS enables scientists and policymakers to pinpoint optimal regions for mulberry farming and silkworm rearing. This mitigates risks and enhances land-use planning. This implies that new sericulture zones can be established with accuracy, rather than on trial-and-error methods. depending Additionally, GIS techniques can facilitate the monitoring and management of disease epidemics. When combined with field reports and cellphone alerts this constitutes a robust method for mitigating crop and cocoon losses. GIS facilitates the monitoring of the enduring effects of

climate change on sericulture, enabling planners to advocate for heat-resistant cultivars or modify rearing procedures in susceptible regions (Sujatha *et al.*, 2024).

- 3. ICT: Linking People, Knowledge, and Possibilities: The function of ICT in sericulture encompasses more than merely mobile applications and GIS. As digital connectivity increases. farmers have integrated become into а broader information ecosystem. Training videos on platforms such as YouTube, voice-guided advisory messages, and WhatsApp-based farmer groups are increasingly prevalent methods for disseminating knowledge and cooperatively addressing issues. Through ICT, farmers can now engage in virtual training courses, submit enquiries to staff. extension and obtain tailored assistance without the need for extensive travel. Numerous regions have built community learning hubs or 'digital kiosks,' enabling groups of farmers to collectively access information (Gunashekhar et al., 2024).
- 4. More Than Just Productivity: Inclusion and Empowerment: The digital evolution of sericulture transcends mere efficiency. It is enhancing the industry's transparency, equity, and inclusivity. Immediate access to pricing information is diminishing reliance on intermediaries. The online monitoring of subsidy applications and registrations equitable allocation guarantees of governmental assistance. Digital tools are providing rural women and youth more confidence and autonomy in managing their enterprises. In numerous states, women-led self-help groups have begun implementing ICT-based solutions for silkworm rearing, mulberry cultivation, value addition, and the online selling of silk goods. This is transforming the socioeconomic landscape of sericulture,



imparting a contemporary and dynamic edge (Kumari *et al.*, 2024).

CONCLUSION: A Digital Thread Toward the Future

Rooted in tradition, sericulture is now weaving a digital future. As rural India embraces ICT, GIS, and mobile apps, silk production is becoming smarter and more sustainable. While challenges like digital literacy and access remain, the path forward is clear. With continued innovation and support, sericulture can preserve its heritage while empowering rural livelihoods with one digital thread at a time.

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