Acta Scientific AGRICULTURE (ISSN: 2581-365X)

Volume 10 Issue 7 September 2026

Research Article

Comparative Assessment of Management Approaches among Sericulture Farmers in High- and Low-Sericulture-Production Villages of Chitradurga District, Karnataka

Pooja V[1]*, Nagaraj KH[2], Shivlingaiah YN[3], Manjunath Gowda[4], D Shashikalabai[5] and Mohan Kumar TL[6]

[1]Ph.D. Scholar, Department of Agricultural Extension, University of Agricultural Sciences, GKVK, Bengaluru, India

[2]Professor and Editor, Communication Centre, University of Agricultural Sciences, GKVK, Bengaluru, India

[3]Dean (Agri.) and Director of Extension, University of Agricultural Sciences, GKVK, Bengaluru, India

[4]Professor, Department of Sericulture, University of Agricultural Sciences, GKVK, Bengaluru, India

[5]Associate Professor, ICAR-AICRP on PHET Scheme, UAS, GKVK, Bengaluru, India

[6]Associate Professor, Department of Agricultural Statistics, Applied Mathematics and Computer Science, University of Agricultural Sciences, GKVK, Bengaluru, India

***Corresponding Author:** Pooja V, Ph.D. Scholar, Department of Agricultural Extension, University of Agricultural Sciences, GKVK, Bengaluru, India.

DOI: 10.31080/ASAG.2026.10.1569

Received: September 03, 2026

Published: September 28, 2026

Abstract

Sericulture production and performance largely depend on how effectively farmers manage mulberry cultivation, silkworm rearing, pest and disease problems, etc. The present study conducted in 2026, compares the management approaches followed by sericulture farmers in high- and low-sericulture-production villages of Chitradurga district, Karnataka. An ex-post facto research design was adopted, and 120 sericulture farmers were selected through a multistage random sampling procedure from 12 villages of Mokalmuru and Chitradurga taluks. An index of management practices was developed with 5 indicators and farmers from high and low production villages were compared. High-production villages performed relatively better in important areas such as variety selection, irrigation, leaf harvesting, temperature management, chawki rearing, timely feeding, cocoon harvesting and waste management practice, whereas, low-production villages showed relatively better performance wrt soil testing, chemical fertilizer application, hygienic practices, bed cleaning, utilization of family labour, division of labour, women's involvement and resource recovery. Among the five indicators of management practices, silkworm rearing management practice received the highest weight in both high-production (0.158) and low-production villages (0.153), whereas integrated waste management received the lowest weight. The overall weighted management index was marginally higher in high-production villages (0.570) than in low-production villages (0.563). The study indicates that differences in production status were mainly associated with variations in specific management practices rather than major differences in overall management. The findings highlight the need for location-specific and practice-oriented extension interventions to strengthen weaker areas of sericulture management.

Keywords: Management Practices; Indicators; Hygienic Practices; Cocoon Harvesting

Introduction

Sericulture is an important rural enterprise that provides income and employment to farm families and can be integrated well with other farming activities [6,26,29,25]. Its performance depends greatly on the timely and efficient management of mulberry cultivation, silkworm rearing, pest and disease management, labour and other farm resources [14,24].

The adoption of improved sericultural practices has been reported to contribute to better cocoon productivity and farm returns [3,7]. Improved technologies relating to mulberry cultivation, silkworm rearing and other production practices have been found to enhance the performance of Sericulture enterprises [3,16,23,30]. Similarly, studies conducted in Karnataka have reported variations in the adoption of improved mulberry cultivation and silkworm rearing technologies, indicating that the level and consistency of adoption may influence the performance of Sericulture enterprises [3,12,15]. However, the extent of adoption and management of these practices varies among farmers due to differences in experience, training, extension contact, access to information and available resources [2,8,10,18,19,21,24,27]. Farmers may also face various constraints in adopting recommended mulberry cultivation and silkworm rearing practices, which can influence the effective management and productivity of Sericulture enterprises [4,12,20].

Such variations may also contribute to differences in sericulture production across villages. Farmers in high-production villages may follow better or more consistent management practices than those in low-production villages. Earlier studies have highlighted the importance of managerial efficiency, managerial attributes and adoption behaviour in influencing the performance of Sericulture farmers [15]. Differences in the development and adoption of Sericultural technologies have also been reported across traditional and non-traditional Sericultural regions, indicating the importance of location-specific production and management conditions [5,28]. However, comparative evidence on management approaches across villages with different levels of sericulture production, particularly in non-traditional sericultural areas, is limited.

Therefore, the present study was undertaken to comparatively assess the management approaches followed by sericulture farmers in high- and low-sericulture-production villages of Chitradurga district, Karnataka, and to identify the major constraints faced by farmers in the two categories of villages.

Conceptual framework: The study was based on the idea that the way farmers manage their sericulture activities may differ between villages with different levels of production. Accordingly, high- and low-sericulture-production villages were considered for comparison. Farmers' management approaches were assessed through five major areas: mulberry farming, silkworm rearing, integrated pest and disease management, human resource management and integrated waste management. The Management Approaches Index was used to assess the overall level of management, while farmers' characteristics and the constraints they faced were considered to better understand the differences between the two groups.

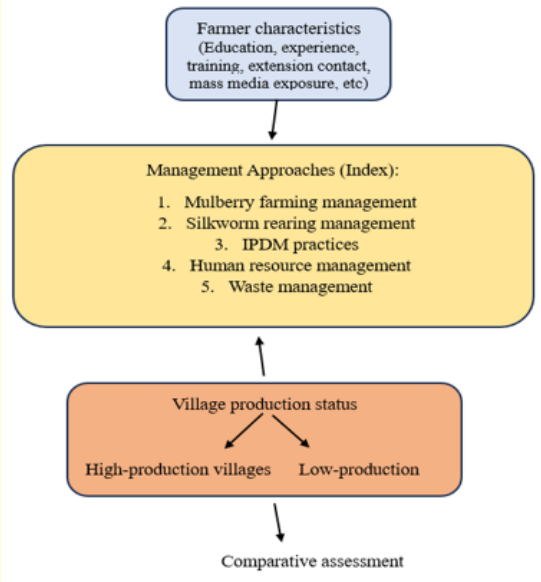

Figure 1: Conceptual framework of the research.

Based on this framework, the study was undertaken with the following objectives:

1. To assess the management approaches followed by sericulture farmers in high- and low-sericulture-production villages of Chitradurga district.
2. To compare the management approaches between farmers of high- and low-sericulture-production villages.

To statistically examine the differences between the two groups, the following null hypothesis was formulated: H_0: There is no

significant difference in the management approaches followed by sericulture farmers in high- and low-sericulture-production villages of Chitradurga district.

Methodology

This study conducted in 2026 employed an ex-post facto research design, to know the management practices followed by farmers in a non-traditional sericultural district i.e. Chitradurga. The study was conducted in two taluks of Chitradurga district i.e. Mokalmuru and Chitradurga taluks based on the production data from Department of Sericulture, Chitradurga (2023-24), considering that in every taluk minimum 60 sericulture farmers are present.

Sl. No.	Taluks	Production (MT)
1	Challakere	14.23
2	Mokalmuru	17.76
3	Hiriyuru	22.7
4	Chitradurga	7.81
5	Holalkere	2.03 (Less than 60 farmers)
6	Hosadurga	6.12 (Less than 60 farmers)

Table 1: Taluk wise production of cocoon in Chitradurga district during 2023-24.

Sampling framework and sample size

A multistage random sampling procedure was followed to ensure systematic and representative coverage. The sampling design was applied uniformly across the selected taluks to account for variations in production.

Villages selection: Three high-productivity and three low-productivity villages were randomly selected from each chosen taluk, resulting in a total of 12 villages within each district.

Respondent selection: From each village, 10 sericulture farmers were randomly selected for the study.

Sampling distribution matrix

Data collection and statistical analysis

The data was collected both from primary and secondary sources. Taluk and village wise data was taken from Sericulture Department and secondary data was collected using pre tested interview schedule.

Chitradurga (Non-traditional sericultural district)			
Mokalmuru (High-production taluk)		**Chitradurga (Low-production taluk)**	
High-production villages	**Low-production villages**	**High-production villages**	**Low-production villages**
Gondluru (10)	Nagasamudra (10)	Azad Nagar (10)	Chikapanahalli (10)
Kodlahalli (10)	Tumukurlahalli (10)	Hampainamalige (10)	Gollarahalli (10)
B. G. Kere (10)	Konsagara (10)	Kurumaranikere (10)	Muddapura (10)
12 villages and 120 farmers			

Table

Development of management practices index: Eight major indicators and thirty-eight sub-indicators representing different dimensions of Sericulture management were listed and it was sent to expert panel for relevancy testing. The relevancy for each sub-indicator was collected based on 5-point continuum from most relevant (5) to not relevant (1). The relevancy per cent of more than 80 was retained in final index. Hence, five indicators and twenty-seven sub-indicators. The retained indicators are as follows: Mulberry farming practices, Silkworm rearing management practices, IPDM practices, human resource management practices and integrated waste management practices. The content validity and split half reliability of the instrument was worked out after pre testing in non-sampling area. The reliability coefficient of the instrument was estimated using Spearman-Brown formula which was found to be 0.867, which means instrument is reliable. The Barlett's test pf significance value for high-producing villages and low-producing villages were obtained 25.10 ($p < 0.001$) and 41.40 ($p < 0.01$), respectively.

Statistical tools used: The collected during data collection was coded, tabulated, normalized and analysed using principle component analysis, t-test, Cohens d, and other tools.

Results and Discussion

Mulberry farming practices in high- and low-production villages: The results presented in the table 2 reveal the variations in the adoption of selected mulberry farming practices between high- and low-production villages. High-production villages recorded higher index values for variety (0.66), spacing (0.90), irrigation (0.30), leaf harvesting (0.39) and pest and disease management (0.29) compared to low-production villages, which recorded index values of 0.63, 0.89, 0.28, 0.30 and 0.28, respectively.

The difference was particularly evident in leaf harvesting, with a Cohen's d value of 3.418, followed by variety selection (d = 2.815) and irrigation management (d = 2.410). These results indicate relatively better management of these practices among farmers in high-production villages. The higher index for leaf harvesting may be important, as proper harvesting practices help ensure the availability of suitable quality leaves for silkworm rearing [22].

In contrast, low-production villages recorded slightly higher index values for soil testing (0.51) and chemical fertilizer application (0.30) compared to high-production villages, which recorded values of 0.47 and 0.29, respectively. The adoption of FYM/organic manure was identical in both groups, with an index value of 0.47.

Overall, the results indicate that farmers in high-production villages performed relatively better in selected technical practices, particularly variety selection, irrigation and leaf harvesting. However, the differences were not consistent across all mulberry farming practices, as low-production villages showed slightly higher adoption of soil testing and chemical fertilizer application. Thus, the production status of the villages appears to be associated with differences in the management of specific mulberry farming practices rather than a uniformly higher level of adoption across all practices. The observed differences in the adoption of mulberry farming are broadly in agreement with earlier studies like Krishnamoorthy., *et al*. (2014) [16]; Murali., *et al.* (2020) [22]; Patil and Kalal (2020) [24].

Sl. No.	Mulberry farming practices	Score range	Index value		t-value	Cohens d
			High-production villages (n_1 = 60)	Low production villages (n_2 = 60)		
1	Soil testing	0-3	0.47	0.51	-8.437	-1.540
2	Variety	0-3	0.66	0.63	15.42	2.815
3	Spacing	1-5	0.90	0.89	3.155	0.576
4	FYM/ organic manure	1-5	0.47	0.47	0	0.00
5	Chemical fertilizers	1-8	0.29	0.30	-11.583	-2.115
6	Irrigation	2-7	0.30	0.28	13.198	2.410
7	Leaf harvesting	0-2	0.39	0.30	18.723	3.418
8	Pest and disease management	0-2	0.29	0.28	2.00	0.365

Table 2: Item wise distribution of Sericulture farmers based on mulberry farming practices in high-productive and low-productive villages (n=120).

Silkworm rearing practices in high- and low-production villages: The results presented in the table reveal differences in selected silkworm rearing practices between high- and low-production villages. High-production villages recorded higher index values for optimization of temperature and humidity (0.72), adoption of chawki rearing (0.73), timely feeding of leaves (0.95) and cocoon harvest method (0.90), compared to 0.56, 0.68, 0.91 and 0.83, respectively, in low-production villages.

The difference was particularly pronounced in the adoption of chawki rearing (Cohen's d = 14.444) and optimization of

temperature and humidity (d = 8.124). Large differences were also observed in timely feeding of leaves (d = 4.042) and cocoon harvest method (d = 4.055). These findings indicate that farmers in high-production villages performed relatively better in these important silkworm rearing operations.

In contrast, low-production villages recorded slightly higher index values for hygienic practices (0.93) and bed cleaning (0.63) compared to high-production villages, which recorded values of 0.89 and 0.60, respectively. The use of disinfectants was identical in both groups, with an index value of 0.78.

Overall, the findings indicate that the differences between high- and low-production villages were mainly evident in specific technical aspects of silkworm rearing, particularly temperature and humidity management, chawki rearing [17,24], timely feeding and cocoon harvesting. Although farmers in low-production villages performed slightly better in hygienic practices and bed cleaning, high-production villages showed better performance in several practices directly related to the management of the silkworm rearing process. The results are in line with findings of Patil and Kalal (2020) [24], Jiragal., *et al.* (2019) [15], Hadimani., *et al*. (2019) [11], Swamy., *et al.* (2021) [30].

Sl. No.	Silkworm rearing practices	Score range	Index value		t-value	Cohens d
			High-production villages (n_1 = 60)	Low production villages (n_2 = 60)		
1	Hygienic Practices	0-3	0.89	0.93	-12.764	-2.330
2	Disinfectants	0-6	0.78	0.78	-0.96	-0.175
3	Optimization of temperature/ humidity	0-5	0.72	0.56	44.50**	8.124
4	Bed Cleaning	0-5	0.60	0.63	-8.801	-1.607
5	Adoption of Chawki Rearing	0-6	0.73	0.68	79.13**	14.444
6	Timely Feeding of Leaves	0-3	0.95	0.91	22.134	4.042
7	Cocoon Harvest Method	0-2	0.90	0.83	22.205	4.055

Table 3: Item wise distribution of sericulture farmers based on silkworm rearing management practices in high-productive and low-productive villages (n = 120).

IPDM practices in high- and low-production villages: The results presented in the table indicate only marginal differences in the adoption of IPDM practices between high- and low-production villages. Both groups reported complete adoption of resistant/ tolerant varieties, with an index value of 1.00. Similarly, the use of chemicals was high in both high-production (0.92) and low-production villages (0.89).

Low-production villages recorded slightly higher index values for preventive measures (0.68), monitoring and early detection of pests and diseases (0.35), and biological control measures (0.13), compared to 0.67, 0.28, and 0.12, respectively, in high-production villages. However, the difference was particularly evident only in biological control measures (Cohen's d = 2.560), whereas no difference was observed in monitoring and early detection (d = 0.000).

Overall, the findings suggest that IPDM practices were broadly similar in both categories of villages. The complete adoption of resistant/tolerant varieties and the high use of chemicals indicate that these were the major pest and disease management practices followed by farmers. In contrast, the low index values for biological control measures and monitoring indicate limited adoption of these components in both high- and low-production villages [11,20,21].

Sl. No.	IPDM practices	Score range	Index value		t-value	Cohens d
			High-production villages (n_1 = 60)	Low production villages (n_2 = 60)		
1	Adoption of Preventive Measures	0-1	0.67	0.68	-8.728	-1.593
2	Monitoring and Early Detection of Pests/Diseases	0-1	0.28	0.35	0.00	0.000
3	Use of Resistant/ Tolerant Varieties	0-1	1.00	1.00	-5.463	-9.997
4	Biological Control Measures	0-3	0.12	0.13	14.019	2.560
5	Use of Chemicals	0-3	0.92	0.89	-2.2660	-0.414

Table 4: Item wise distribution of sericulture farmers based on integrated pest and disease management practices in high-productive and low-productive villages (n = 120).

Human resource management practices in high- and low-production villages: The results presented in the table show differences in selected human resource management practices between high- and low-production villages. Low-production villages recorded higher index values for family labour (0.51), division of labour (0.24), and women involvement (0.43) compared to high-production villages, which recorded values of 0.32, 0.16, and 0.39, respectively.

The difference was particularly pronounced in the utilization of family labour (Cohen's d = -7.125), followed by division of labour (d = -3.871) and women involvement (d = -1.852). This indicates greater involvement of family members and women in sericultural activities in low-production villages.

In contrast, high-production villages recorded a marginally higher index value for participation in training and extension programmes (0.79) compared to low-production villages (0.78), with a Cohen's *d* value of 1.976.

Overall, the findings indicate that low-production villages showed greater reliance on family labour and labour division [21,24], whereas farmers in high-production villages showed slightly higher participation in training and extension programmes [1]. Obtained results are in line with Geetha and Geetha Devi (2008) [9]; Geetha Devi., *et al.* (2018) [8]; Kumari and Rajan, (2015) [17]; Ahammed., *et al.* (2026) [1].

Sl. No.	Human resources management practices	Score range	Index value		t-value	Cohens d
			High-production villages (n_1 = 60)	Low production villages (n_2 = 60)		
1	Family labour	0-3	0.32	0.51	-39.025**	-7.125
2	Division of labour	0-2	0.16	0.24	-21.196*	-3.871
3	Women involvement	0-4	0.39	0.43	-10.139	-1.852
4	Participation in training/ extension programmes	0-4	0.79	0.78	10.822	1.976

Table 5: Item wise distribution of sericulture farmers based on human resource management practices in high-productive and low-productive villages (n = 120).

Integrated waste management practices in high- and low-production villages: The results presented in the table reveal differences in selected integrated waste management practices between high- and low-production villages. High-production villages recorded higher index values for disposal of diseased worms (0.58), economic returns from waste management (0.50), and environmental indicators (0.70), compared to 0.37, 0.12, and 0.48, respectively, in low-production villages.

The difference was particularly pronounced for environmental indicators (Cohen's d = 7.637) and disposal of diseased worms (d = 4.736). A considerable difference was also observed in economic returns from waste management (d = 1.890). These results indicate relatively better performance of high-production villages in these aspects of integrated waste management.

In contrast, low-production villages recorded a slightly higher index value for resource recovery (0.35) compared to high-production villages (0.32), with a relatively smaller effect size (d = -0.703).

Overall, the findings indicate that high-production villages performed better in the safe disposal of diseased worms, economic utilization of waste, and environmental management, whereas resource recovery was marginally higher in low-production villages. Similar results are obtained by Dandin and Giridhar (2012) [6], Lakshmanan., *et al*. (2016) [18], Amarnatha., *et al*. (2024) [3].

Sl. No.	Integrated waste management practices	Score range	Index value		t-value	Cohens d
			High-production villages (n_1 = 60)	Low production villages (n_2 = 60)		
1	Disposal of diseased worms	0-1	0.58	0.37	25.942*	4.736
2	Resource recovery	0-3	0.32	0.35	-3.853	-0.703
3	Economics returns	0-3	0.50	0.12	10.356	1.890
4	Environmental indicators	0-2	0.70	0.48	41.832**	7.637

Table 6: Item wise distribution of Sericulture farmers based on integrated waste management practices in high-productive and low-productive villages (n = 120).

Comparative performance of integrated waste management practices: The comparison of the five major management indicators revealed differences in their relative importance between high- and low-production villages. In high-production villages, silkworm rearing management practices recorded the highest index value (0.79) and ranked first, followed by human resource management (0.66, Rank II), IPDM practices (0.56, Rank III), mulberry farming (0.44, Rank IV) and integrated waste management (0.38, Rank V).

A different pattern was observed in low-production villages, where human resource management recorded the highest index value (0.76) and ranked first, followed by silkworm rearing management practices (0.75, Rank II). IPDM practices occupied Rank III with an index value of 0.57, while mulberry farming (0.43) and integrated waste management (0.31) retained Ranks IV and V, respectively.

The results indicate that the major difference between the two groups was in the relative position of silkworm rearing and human resource management. High-production villages showed better performance in silkworm rearing management, whereas low-production villages recorded a higher index for human resource management. Mulberry farming and integrated waste management occupied the same ranks in both groups, indicating a similar relative level of management in these two areas. Overall, integrated waste management recorded the lowest index in both categories of villages, highlighting it as the comparatively weaker management area among the farmers studied.

Factor loadings, weights and overall weighted management index: The factor analysis results presented in the table show that all five management indicators recorded high factor loadings in

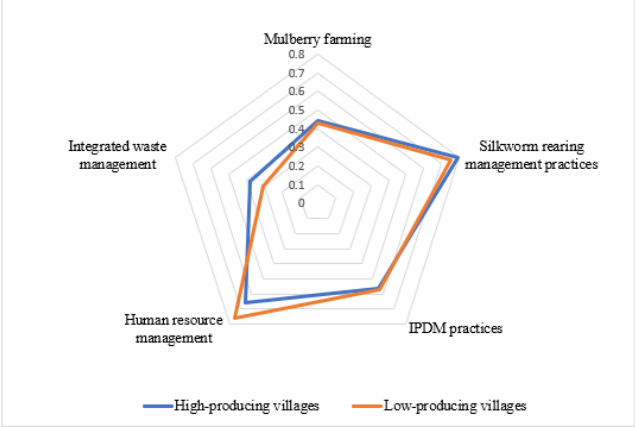

Figure 2: Distribution of Sericulture farmers based on management practices index among five indicators.

both high- and low-production villages, indicating their relevance in representing the overall management approaches followed by sericulture farmers.

Among the indicators, silkworm rearing management practices received the highest weight in high-production villages (0.158), followed by human resource management (0.134), IPDM practices (0.114), mulberry farming (0.087) and integrated waste management (0.073). A similar pattern was observed in low-production villages, where silkworm rearing management practices received the highest weight (0.153), followed by human resource management (0.149), IPDM practices (0.113), mulberry farming (0.089) and integrated waste management (0.059).

The overall weighted management index was marginally higher in high-production villages (0.570) than in low-production villages (0.563). The small difference indicates that the overall management approaches followed by farmers in the two categories of villages were broadly comparable. However, the component-wise results showed differences in the performance of specific management practices between the two groups. The higher overall weighted index in high-production villages may therefore be associated with their relatively better performance in selected management components, particularly silkworm rearing and waste management practices.

Sl. No.	Indicators	High-production villages (n_1 = 60)		Low production villages (n_2 = 60)	
		Factor loadings	Weight	Factor loadings	Weight
1	Mulberry farming	0.970	0.087	0.982	0.089
2	Silkworm rearing management practices	0.982	0.158	0.982	0.153
3	IPDM practices	0.996	0.114	0.959	0.113
4	Human resource management	0.995	0.134	0.950	0.149
5	Integrated waste management	0.953	0.073	0.946	0.059
	Overall weighted index	0.570		0.563	

Table 7: Distribution of Sericulture farmers based on indicators wise factor loadings and weightage based on Principle Component Analysis in high-productive and low-productive villages (n = 120).

Distribution of farmers according to overall management approaches: The distribution of farmers according to their overall management approaches revealed some variation between high- and low-production villages. In high-production villages, the largest proportion of farmers belonged to the medium category (43.33%), followed by the low (30.00%) and high (26.67%) categories. Similarly, in low-production villages, 38.44 per cent of farmers belonged to the medium category, closely followed by the low category (38.33%), while 23.34 per cent were classified under the high category.

A comparison between the two groups showed that high-production villages had a lower proportion of farmers in the low management category and a relatively higher proportion in the medium and high categories compared to low-production villages. Overall, the findings indicate a slightly better distribution of management approaches among farmers in high-production villages, although the differences between the two groups were relatively small [13,15,22,30].

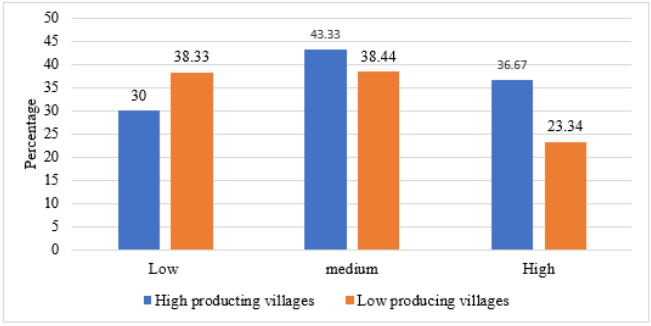

Figure 3: Overall management practices followed by Sericulture farmers in high-producing and low-producing villages.

Hence, the null hypothesis is rejected, that a statistically significant difference was observed between sericulture farmers of high and low production villages with respect to their overall management practices.

Implications of the Study

The findings indicate that differences between high- and low-production villages were mainly observed in specific management practices rather than in the overall level of management. High-production villages performed relatively better in critical silkworm rearing practices, particularly temperature and humidity management, chawki rearing, timely feeding and cocoon harvesting.

Integrated waste management was the weakest area in both categories, while biological control and pest monitoring also showed low adoption. The findings suggest that improving these specific management gaps may help strengthen sericulture production.

Policy Recommendations

Extension efforts should focus on practical training in chawki rearing, temperature and humidity management, and other critical silkworm rearing practices, particularly in low-production villages. Greater attention should also be given to integrated waste management, biological control and pest monitoring. Village-specific and need-based interventions, supported by field demonstrations and farmer-to-farmer learning, may help improve the adoption of effective management practices.

Bibliography

1. Ahammed I., *et al*. "Impact of sericultural training on knowledge and adoption of sustainable mulberry cultivation practices among seri-farmers in eastern India". *Discover Agriculture* 4 (2026): 136.

2. Ahmed O., *et al*. "Exploring the relationship between farmer characteristics and training effectiveness in sericulture cultivation". *International Journal of Research and Innovation in Social Science* 8.2 (2024): 883-900.

3. Amarnatha N., *et al*. "Impact of adoption of mulberry and silkworm practice on yield and income of bivoltine hybrid silkworm rearing sericulturists of South Eastern Dry Zone of Karnataka". *Journal of Advances in Biology and Biotechnology* 27.9 (2024): 550-555.

4. Basavaiah and CS Kallimani. "Constraints faced in the adoption of technologies by Chawki Rearing Centre entrepreneurs". *Journal of Extension Education* 32.2 (2020): 6520-6530.

5. Bharath Kumar KS., *et al*. "Growth and development of sericulture in non-traditional areas of Karnataka". *International Journal of Current Microbiology and Applied Sciences* 8.7 (2019): 1450-1458.

6. Dandin SB and MS Giridhar. "Integrated farming systems in sericulture for sustainable livelihood security". *Indian Silk* 51.4 (2012): 18-21.

7. Dayananda and P Kumaresan. "Impact of integrated sericultural technologies on cocoon productivity at farmer level". *Journal of Agricultural Extension Management* 11.1 (2010): 97-106.

8. Geetha Devi RG., *et al*. "Role of extension services in adoption of improved sericulture technologies". *Indian Silk* 57.7 (2018): 20-24.

9. Geetha GS and RG Geetha Devi. "Technology adoption and training needs of sericulture farmers – A case study in NGO". *Indian Journal of Agricultural Research* 42.3 (2008): 157-163.

10. Goswami C., *et al*. "Socio-economic profile and extent of adoption of sericulture technologies in Assam". *Journal of Rural and Agricultural Research* 19.2 (2019): 112-116.

11. Hadimani DK., *et al*. "Constraints faced and suggestions by farmers to overcome constraints in adoption of improved sericulture production technologies of Bidar district of North Karnataka". *Journal of Pharmacognosy and Phytochemistry* 8.2 (2019): 784-786.

12. Hadimani DK., *et al*. "Extent of adoption of improved sericulture production technologies by farmers of Bidar district of North Karnataka". *Journal of Pharmacognosy and Phytochemistry* 8.2 (2019): 790-792.

13. Harisha N., *et al*. "Attitude of sericulture beneficiary farmers towards the activities of Technical Service Centres (TSCs) in Karnataka State of India". *Asian Journal of Agricultural Extension, Economics and Sociology* 39.11 (2021): 114-122.

14. Hosamani V., *et al*. "Social betterment and economic empowerment of sericulture farmers in Northern Hilly Zone of Karnataka, India". *Asian Journal of Agricultural Extension, Economics and Sociology* 41.8 (2023): 127-133.

15. Jiragal I., *et al*. "Adoption level of bi-voltine silkworm rearing practices among farmers of Chitradurga District, India". *International Journal of Current Microbiology and Applied Sciences* 8.2 (2019): 2481-2488.

16. Krishnamoorthy SV., *et al*. "Adoption of improved sericulture technologies by farmers in Karnataka". *Mysore Journal of Agricultural Sciences* 48.3 (2014): 421-426.

17. Kumari KMV and RK Rajan. "Impact of training on knowledge and adoption levels of Chawki rearing centre owners of Karnataka state". *Agricultural Science Digest* 35.3 (2015): 203-206.

18. Lakshmanan S., *et al*. "Adoption behaviour of sericulture farmers towards sustainable production technologies". *Journal of Extension Education* 28.2 (2016): 5612-5618.

19. Manjunath L., *et al*. "Psychological characteristics influencing adoption behaviour of sericulture farmers". *Journal of Farm Sciences* 32.2 (2019): 205-209.

20. Manohar KN., *et al*. "Constraints faced by the sericulture farmers in adoption of recommended sericulture cultivation practices in Northern Karnataka". *Agriculture Update* 15.4 (2020): 289-292.

21. Moulasab and SN Sudhakara. "Problems faced by sericulture farmers by adoption of improved production technology practices from Koppal district of Karnataka". *Crop Research* 52.6 (2017): 288-293.

22. Murali N., *et al*. "Adoption pattern of mulberry cultivation and silkworm rearing in the Eastern Dry Zone of Karnataka, India". *International Journal of Current Microbiology and Applied Sciences* 9.8 (2020): 953-959.

23. Parameswaranaik J., *et al*. "Adoption of improved sericultural technologies among farmers of Mizoram State". *Journal of Agricultural Extension Management* 20.2 (2020): 83-90.

24. Patil SP and A Kalal. "Adoption of sericulture production technologies in northern Karnataka". *Journal of Farm Sciences* 33.4 (2020): 546-549.

25. Rabha P., *et al*. "Extent of livelihood opportunity of the sericulture farmers in Kamrup district of Assam". *Environment Conservation Journal* 24.1 (2023): 110-115.

26. Sharma S and K Bali. "Socio-economic impact of sericulture in rural development". *International Journal of Agricultural Science Research* 8.3 (2018): 95-100.

27. Shatibarua D., *et al*. "Adoption behaviour of sericulture farmers regarding improved technologies of Jorhat district of Assam". *Indian Journal of Extension Education* 58.1 (2022): 26-30.

28. Somashekar RK., *et al*. "Comparative analysis of sericulture practices in traditional and non-traditional regions of Karnataka". *International Journal of Rural Studies* 25.1 (2018): 45-52.

29. Sridhar KB., *et al*. "Sericulture as a livelihood security enterprise in rural India". *Indian Silk* 55.9 (2016): 10-15.

30. Swamy MM., *et al*. "Adoption level of improved sericulture practices among farmers in Karnataka". *Current Journal of Applied Science and Technology* 40.18 (2021): 52-58.