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Socioeconomic Profile and Its Influence on Knowledge Adoption in Mulberry Cultivation: A Study in the Chattier District

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Abstract

Silk farming is a vital agro-based rural enterprise that generates continuous employment and plays a significant role in strengthening the rural economy. Scientific advancements in sericulture have markedly improved cocoon quality and productivity. The gap is largely influenced by farmers' awareness, knowledge, and adoption of improved sericulture technologies. Knowledge has become a crucial driver of productivity across agricultural and allied sectors, including sericulture. The present study was undertaken in the Chittoor district of Andhra Pradesh, one of the state's major cocoon-producing regions, where mulberry cultivation is widely practiced under irrigated conditions. Two mandals, Peddapanjani and Gangavaram, were selected based on the intensity of mulberry acreage and sericulture activity, in consultation with sericulture officers. From each mandal, two villages were chosen for data collection. A total of 120 sericulture farmers representing marginal, small, and large farm categories were selected using proportional sampling techniques. Primary data were collected through personal interviews using a pretested and structured questionnaire. The schedule covered key socio-economic variables such as age, educational level, family size, farming experience, contact with extension personnel, participation in extension activities, and farmers' knowledge levels regarding mulberry cultivation technologies. Pre-testing ensured the clarity, relevance, and reliability of the questionnaire. The findings reveal that socio-economic factors significantly influence knowledge adoption among sericulturists. Farmers aged 36–55 years, those educated up to high school, individuals with smaller family sizes, those having considerable sericulture experience, and farmers with higher income levels demonstrated comparatively better awareness and understanding of modern sericulture technologies. Study highlights the need to strengthen extension services and promote knowledge dissemination to bridge the yield gap in mulberry farming.

Keywords: *Sericulture; Knowledge adoption; Mulberry cultivation*

1. Introduction

Sericulture is emerging as a highly promising enterprise that complements agriculture and enhances the income of both small and large farmers. As a labor-intensive, agro-based industry, it offers substantial employment opportunities, particularly to rural households. The sericulture sector encompasses a long chain of activities from mulberry cultivation to silk fabric production, making it a unique farm-to-industry system. In the drought-prone areas of southern Andhra Pradesh, especially in the Chittoor and Ananthapur districts, sericulture has become a more dependable livelihood option compared to food and other commercial crops. Its rural orientation and labor-intensive nature make it especially suitable for improving the socio-economic conditions of poorer households. Because

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mulberry cultivation and silkworm rearing provide regular returns throughout the year, sericulture has proven to be a powerful instrument for rural development. It also ensures continuous employment for family members and supports the weaker sections of society (Lakshmanan et al., 1998).

Over the years, research institutions have developed several new technologies that greatly benefit the sericulture sector. However, the industry can grow only when these innovations effectively reach farmers and are adopted at the field level. Recognizing this need, sericulture extension personnel regularly conduct awareness and training programs to promote improved practices. Since farmers' knowledge and adoption of advanced sericulture techniques are strongly influenced by socio-economic factors such as education and economic status, the present study was undertaken to assess the impact of these variables on the adoption of innovative sericulture technologies by farmers in the Chittoor district of Andhra Pradesh.

2. Sericulture cultivation in India

Sericulture, the cultivation of silkworms for silk production, is one of the oldest agro-based industries in India. The country is the second-largest producer of silk in the world and the only nation that produces all four commercial varieties of silk: mulberry, tasar, ere, and muga. Sericulture plays a crucial role in rural development by providing sustainable employment, especially for small farmers, women, and landless laborers. Its advantages low investment, short gestation period, and steady income make it one of the most suitable livelihood activities in rural India. Over the years, technological advancements, improved silkworm breeds, and government support programs have contributed significantly to the growth of this sector.

The sericulture sector in India supports livelihoods for roughly 9.7–9.8 million people across rural and semi-urban areas. As of 2023–24, the area under mulberry plantation in India was about 263,352 hectares. Raw silk production nationally has been rising: according to recent estimates, it increased from ~31,906 metric tons (in 2017–18) to 38,913 metric tons in 2023–24. Mulberry silk remains the dominant variety, constituting a large share of total silk production in India. The growth in plantation area and raw silk production underscores expanding opportunity for sericulture, increasing the relevance of studies on adoption of improved technologies. High employment numbers also reinforce that sericulture remains a major rural livelihood source, particularly among economically weaker or socially underprivileged sections.

According to the most recent state-level survey data, in 2023–24, total mulberry plantation in Andhra Pradesh stood at 145,707 acres. That year, the state produced 76,360 metric tons of mulberry cocoons and generated 10,489 metric tons of raw silk. During 2024–25 (as reported up to December 2024): About 61,394 MT of quality cocoons were produced, and reeling operations yielded 8,458 MT of quality raw silk. The value-added (GVA) contribution of sericulture to the state economy was recorded, underscoring its economic significance. Also, according to a more general industry-wide overview, Andhra Pradesh ranked second among Indian states in silk production (after Karnataka), contributing around 25% of the national silk output**.** Sericulture remains a significant economic activity in Andhra Pradesh, with a substantial area under mulberry, high cocoon and raw silk output, and strong institutional support. These contemporary figures provide a firm quantitative backdrop for any study assessing technology adoption, yield gaps, and socio-economic determinants.

3. Sericulture cultivation in Andhra Pradesh

Andhra Pradesh is one of the leading states in India in mulberry cultivation and cocoon production. Favorable agro-climatic conditions, fertile land, and a long tradition of silk rearing have made sericulture a key rural occupation. The state has developed an extensive network of sericulture training centers, seed production units, chawki rearing centers, and extension services to support farmers. Government schemes, subsidies, and the introduction of bivoltine silkworm breeds have further boosted both the quality and quantity of cocoons. As a result, sericulture has become an important livelihood activity, particularly in the Rayalaseema and South Coastal regions.

4. Sericulture cultivation in Chittoor District

Chittoor district occupies a prominent place in the sericulture landscape of Andhra Pradesh. The district's climatic conditions, particularly in mandals such as Palamaner, Madanapalle, Punganur, and Chittoor, are well suited for mulberry cultivation and silkworm rearing. A large number of households in the district depend on sericulture as a primary or supplementary source of income. Chittoor has well-established mulberry farms, cocoon markets, and rearing houses, and farmers here actively participate in government extension programmes. The district is known for producing good-quality bivoltine cocoons, owing to increased adoption of improved technologies, systematic rearing practices, and better access to technical guidance. Sericulture in Chittoor not only supports the rural economy but also plays a major role in women's empowerment, as many women are involved in mulberry cultivation, silkworm rearing, and cocoon harvesting.

In 2024, a news report mentioned that in parts of (erstwhile) Chittoor district, there are about 12,839 acres under mulberry plantations. That article further noted rising cocoon prices (e.g. in 2024 cocoons reportedly fetched ₹ 505–550 per kg, up from ₹ 275 in 2019), which reportedly has made sericulture more profitable for farmers in the region. Earlier (2022), another source noted that around 27,000 acres in Chittoor district had been dedicated to mulberry cultivation; and that cocoons produced in the region (among multiple mandals) contributed significantly to annual yield (~20,000–25,000 MT per annum) when taken together. Chittoor remains a relevant and active sericulture zone in Andhra Pradesh, with real growth in cultivation area, rising market value for cocoons, and continued participation by rural farmers. This makes it a good focal area for socio-economic and adoption-level investigations.

5. Review of literature

There are very limited studies that are directly relevant to the present study. They have been taken from journals and articles and were taken for the study.

(2023) The study, Current Scenario of Sericulture Industry in Traditional Silk Producing States of India, reviews historic trends (1980–2017) in mulberry acreage, cocoon, and raw silk production across major traditional silk states (including Andhra Pradesh). This helps contextualize long-term patterns of growth, stagnation, and structural challenges that still shape the industry today.

(2025) review emphasized that Sericulture as a Tool for Rural Development and Women Empowerment highlights how sericulture continues to be a key driver of rural employment, income diversification, and poverty alleviation, especially among socially and economically disadvantaged populations. It also notes that participation of women (in mulberry cultivation, rearing, and cocoon work) has helped in empowering them, improving household income, and strengthening community resilience.

(2024) A broader historical and industry-wide analysis, The Evolution of the Sericulture Industry in India: From Tradition to Modernity**,** traces how sericulture in India has shifted from traditional, labor-intensive practices to a more technology- and market-oriented industry, thereby expanding opportunities for livelihoods, entrepreneurship, and rural-urban economic linkages.

(2024), A regional empirical study focused on the challenges and adoption of bivoltine hybrid silkworm rearing in Karnataka's southeastern dry zone, India, found that even when recommended practices (improved mulberry varieties, proper irrigation) are known, their adoption remains uneven. For example, while use of recommended mulberry varieties was nearly universal, only about 60% of rearers followed prescribed fertilizer and pest-management practices. Key constraints identified included limited access to quality inputs, inadequate extension services, insufficient technical knowledge, and financial barriers.

(2025) A field-level study in northern Karnataka Understanding Sericulture through a Socio-Economic Lens: Evidence from Northern Karnataka, India**,** revealed that although many farmers showed economic motivation, their participation in training, use of modern technologies, and extension contact remained low. This underscores a persistent knowledge–adoption gap, especially among small and marginal growers.

6. Objectives of the Study

- To study the socio-economic characteristics of sericulture farmers in the selected villages of Peddapanjani and Gangavaram mandals of Palamaner revenue division in Chittoor district.
- To assess the knowledge levels of marginal, small, and large mulberry growers regarding recommended mulberry cultivation technologies.
- To analyze the relationship between socio-economic parameters (age, education, family size, income, farming experience, information-seeking behavior, and extension contact) and the knowledge level of sericulture farmers.
- To identify the gaps in knowledge and adoption of improved mulberry cultivation practices and suggest measures to strengthen extension and training programs for sericulture farmers.

7. Research Gap

Although sericulture is a major livelihood activity in Chittoor district, especially in Palamaner division, limited studies have systematically examined how socio-economic characteristics influence farmers' knowledge and adoption of recommended mulberry cultivation technologies. Existing research largely focuses on productivity, market trends, or general constraints, but there is insufficient empirical evidence linking farmer characteristics (such as education, experience, family size, income, and extension contact) with knowledge levels at the village. Therefore, this study fills the gap by assessing knowledge differences among marginal, small, and large farmers and identifying the socio-economic determinants influencing their awareness of improved mulberry cultivation practices.

8. Methodology

The present study was taken up in the Chittoor district, which is the main cocoon-producing region in Andhra Pradesh. The Chittoor district of Andhra Pradesh, where sericulture is widely practiced under irrigated conditions. Based on the concentration of mulberry acreage and sericulture activities and in consultation with the sericulture officers, 2 mandals in the Palamaner revenue division were selected. From each mandal, 2 villages were selected. Peddapanjani mandal Sivadi and Appinapalli Villages Gangavaram Mandal from the selected villages, Dandapalli and Gandrajupalli, 12 sericulture farmers from different groups of farmers, i.e., small (4), marginal (4), and big (4), were selected. Thus, the total sample size is 120 farmers. The farmers were categorized into marginal, small, and large farmers based on the landholding size of the mulberry garden. The data was collected on socio-economic parameters such as age, education, family size, experience, contact with extension personnel, participation in extension activities, and level of knowledge in mulberry production technologies by using a pre-prepared and tested questionnaire through the personal interview method. Pre-testing was done to ensure that the questions in the interview schedule were clear, complete, unambiguous, and comprehensive before the finalization of the interview schedule. The data was tabulated and subjected to statistical analysis using SPSS software.

9. Results and Discussion

Socio-personal and socio-economic characteristics of the respondents were grouped according to key attributes such as age, type of family, size of landholding, and educational status. These classifications are summarized and presented in Table 1, which presents the details of the distribution of respondents according to their age.

Table-1 Distribution of sample respondents according to their age

Variables	Farmers type				Total
Age	Category	Marginal	Small	Large	
	0-18	4(10.0)	8(20.0)	2(5.0)	14(11.67)
	19-35	13(32.5%)	12(30%)	9(22.5%)	34(28.33)
	36-55	11(27.5%)	14(35%)	15(37.5%)	40(33.33)
	56 & above	12(30%)	6(15%)	14(35%)	32(26.67)
	Total	40(100%)	40(100%)	40(100%)	120(100.00)

Source: Field survey data

Table 1 shows the age-wise distribution of sericulture farmers across marginal, small, and large farm categories. The results indicate that the 36–55-year-old age group constitutes the highest proportion of respondents (33.33%)**,** suggesting that middle-aged farmers are the most actively involved in sericulture activities. This group likely represents farmers with a balance of experience, physical ability, and economic responsibility. The 19–35-year-oldgroup forms 28.33% of the sample, indicating moderate participation of young farmers in sericulture. Their involvement is important, as it reflects the interest of the younger generation in continuing sericulture as a livelihood. The 56 years and above group accounts for 26.67%, showing that a substantial number of older farmers also continue sericulture, possibly due to experience and dependence on traditional occupation. The lowest representation is from the 0–18 years category (11.67%), which is expected because farming activities are generally handled by adults, and individuals in this age group are mostly students or dependents.

Table-2 Distribution of sample respondents according to their Education

Variables	Educational background				Total
Education	Category	Marginal	Small	Large	
	Illiterate	3(7.5)	5(12.5)	1(2.5)	9(7.5)
	Primary	20(50.0)	14(35.0)	19(47.5)	53(44.17)
	High School	12(30.0)	15(37.5)	11(27.5)	38(31.67)
	College	5(12.5)	6(15.0)	9(22.5)	20(16.67)
	Total	40(100.0)	40(100.0)	40(100.0)	120(100.0)

Source: Field survey data

The data in Table-2 shows that the majority of sericulture farmers across all three categories marginal, small, and large—have basic schooling. Primary education is the most common level, accounting for 44.17% of the total respondents, followed by high school education (31.67%).A smaller proportion (16.67%) of farmers has college-level education, indicating limited higher educational attainment in the study area. The number of illiterate farmers is low (7.5%), suggesting a generally moderate literacy level among sericulturists. Overall, the distribution indicates that most farmers possess at least basic education, which may positively influence their ability to understand and adopt improved sericulture practices.

10. Family Size

Table-3 Distribution of sample respondents according to their family size

Variables	Farmers type				Total	Percent
Family Size	Category	Marginal	Small	Large		
	Small	20	17	19	56	(46.67)
	Medium	13	15	12	40	(33.33)
	Large	7	8	9	24	(20.0)
	Total	40	40	40	120	(100.0)

Source: Field survey data

The data in Table 3 shows that the majority of the respondents (46.67%) belong to small-sized families, indicating a preference for nuclear family structures among farming households. About one-third (33.33%) of the respondents fall under the medium-sized family category. Only 20 percent of the households have large families, suggesting that extended family systems are less common. The distribution is fairly consistent across marginal, small, and large farmers, reflecting that family size does not vary significantly with farm size.

Table-4: Farming experience in Sericulture

Variables	**Farmers type**				**Total**	**Percent**
	Category	Marginal	Small	Large		
Farming Experience	3-5 years	7	8	7	22	18.34
	5-10 years	12	11	14	37	30.83
	10-20 years	14	13	16	43	35.83
	20-30 years	7	8	3	18	15.0
	Total	40	40	40	120	100.0

Source: Field survey data

Table 4 indicates that a majority of the respondents have substantial experience in sericulture. The largest portion, 35.83%, has 10–20 years of experience, followed by 30.83% who have been engaged in sericulture for 5–10 years. Only 18.34% of respondents fall in the 3–5 years category, indicating fewer newcomers to the activity. A smaller share, 15%, has long-term experience of 20–30 years. Overall, the distribution shows that sericulture in the study area is largely practiced by farmers with moderate to high experience, reflecting a stable and sustained engagement in the activity across all farmer categories.

Table-5: Annual income of Sericulture /acre

Variables	**Farmers type**				**Total**	**Percent**
	Category	Marginal	Small	Large		
Annual Income	Below 50000	13	10	0	23	19.17
	50000-100000	10	14	3	27	22.5
	100000-150000	9	11	13	33	27.5
	150000 & above	8	5	24	37	30.83
	Total	40	40	40	120	100.00

Source: Field survey data

The income distribution shows clear differences across the farmer categories. A significant share of respondents (30.83%) earn₹150,000 and above per acre**,** with large farmers dominating this category. Another 27.5% of farmers earn between ₹100,000 and ₹150,000, indicating that over half the respondents receive moderately high returns from sericulture. Lower-income categories have fewer respondents: 22.5% earn ₹50,000–₹100, 000, while 19.17%earnbelow ₹50,000, mainly marginal and small farmers. Overall, the data suggests that sericulture is a profitable activity, particularly for large farmers who achieve higher income levels due to better resources, scale of operations, and efficient management practices.

Table-6: Information seeking Behavior

Variables	Farmers type				Total	Percent
Information seeking behavior	Category	Marginal	Small	Large		
	Never	9	11	10	30	25.0
	Rare	7	6	7	20	16.67
	Occasionally	15	16	14	45	37.5
	Regularly	9	7	9	25	20.83
	Total	40	40	40	120	100.00

Source: Field survey data

Table 6 presents the majority of the sericulture farmers (37.5%) seeking information occasionally**,** indicating that they access information only when required, rather than as a regular practice. About 20.83% of farmers seek information regularly, reflecting a smaller but proactive group that frequently updates their knowledge. On the other hand, 25% of farmers never seek information, showing a significant gap in awareness or access to extension services. Another 16.67% seek information rarely, suggesting limited engagement with information sources. Overall, the pattern shows that while some farmers are actively seeking information, a large proportion still lack consistent information-seeking habits, which may affect productivity and adoption of improved sericulture practices.

Table 7: Correlation coefficient between knowledge in mulberry cultivation and personal socioeconomic characteristics of the sericulturists

Variables	**Farmers type**			
	Category	Marginal	Small	Large
1	Age	0.751**	0.751**	0.006
2	Education	0.699**	0.732**	0.775**
3	Family size	0.036	0.004	-0.005
4	Farming experience in Sericulture	0.482**	0.665**	0.529**
5	Annual income	0.432**	0.487**	0.348**
6	Information seeking behavior	0.179	0.494**	0.442**

Source: Field survey data

10.1 Age

- Marginal and small farmers (0.751**) show a strong positive and highly significant correlation with knowledge. This means older farmers in these groups tend to have higher knowledge levels. Large farmers (0.006) show no meaningful relationship, indicating age does not influence their knowledge.

10.2 Education

- All groups—marginal (0.699**), small (0.732**), and large (0.775**)—show a strong, significant positive correlation with knowledge. This confirms that education is one of the most important determinants of knowledge in mulberry cultivation.

10.3 Family Size

- Correlation values for all groups are very low and non-significant (0.036, 0.004, –0.005). This means family size has no influence on farmers' knowledge levels.

10.4 Farming Experience in Sericulture

- There is a significant positive correlation for marginal (0.482**), small (0.665**), and large (0.529**) farmers. This indicates that more experienced farmers have higher knowledge of mulberry cultivation practices.

10.5 Annual Income

- All three groups show a significant positive relationship (0.432**, 0.487**, 0.348**). Higher-income farmers generally possess better knowledge, likely due to greater access to inputs and training.

10.6 Information-Seeking Behavior

- Small (0.494**) and large farmers (0.442**) show a significant positive correlation, meaning those who seek information more often have better knowledge. For marginal farmers (0.179**)**, the relationship is positive but non-significant, indicating limited influence.

11. Conclusion

The findings of the study reveal that the overall knowledge levels regarding improved mulberry cultivation practices were relatively high across marginal, small, and large sericulture farmers in the Chittoor district. This knowledge played a crucial role in influencing mulberry yield and quality parameters. Factors such as farming experience, educational attainment, landholding size, and participation in extension activities were found to significantly enhance productivity and improve crop quality. However, there remains a need to further strengthen practical training and motivation among farmers to enhance their knowledge base and adoption of recommended practices. The study clearly demonstrates that socio-economic characteristics of farmers strongly determine the extent to which they adopt recommended sericulture technologies. Therefore, while introducing new technologies in mulberry cultivation in Chittoor district, it is essential to consider the socio-economic background of farmers. The investigation also highlighted that socio-economic variables, particularly experience, education, farm size, and involvement in extension programs, contribute substantially to improving knowledge among all three categories of sericulturists, ultimately leading to better qualitative and quantitative mulberry yields. Despite this, certain gaps still exist in the adoption of the complete package of practices. Hence, greater emphasis should be placed on motivating farmers and raising awareness about improved cultivation techniques. Extension strategies must be tailored to the socio-economic conditions of farmers, ensuring that the methods used effectively encourage adoption. Strengthening the extension system with appropriate tools and approaches will play a key role in enhancing mulberry leaf yield and supporting sustainable sericulture development in the region.

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