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A socio-economic analysis of sericulture farmers in Kothar Area, Anantnag District, Jammu and Kashmir

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Abstract

The sericulture industry, with its eco-friendly and labor-intensive nature, serves as a vital livelihood source for rural communities. This study focuses on the socio-economic profile of sericulture farmers in the Kothar area of Anantnag district, Jammu and Kashmir. Using a structured interview schedule, data were collected from 120 respondents across eight sericulture beats, encompassing parameters such as age, education, landholding, income, experience, and access to information. The findings reveal that the majority of farmers are middle-aged, with medium levels of scientific orientation and farming experience. However, challenges such as high illiteracy rates, limited exposure to information sources, small landholdings, and minimal mulberry cultivation constrain the full potential of sericulture. Despite these limitations, sericulture remains a significant economic activity, providing a sustainable livelihood to marginalized and small-scale farmers. The study highlights the need for enhanced extension services, capacity-building programs, and targeted interventions to improve knowledge, productivity, and technology adoption. Strengthening these areas can bridge existing gaps, promoting the growth of sericulture and uplifting rural livelihoods in the region.

Keywords: Sericulture farmers, socio-economic profile, Kothar area, Anantnag district, rural livelihoods, technology adoption

Introduction

Sericulture, an eco-friendly, agro-based, labor-intensive industry, has evolved into a highly lucrative and commercially attractive economic activity within the cottage and small-scale sectors. It encompasses a comprehensive value chain, starting from mulberry cultivation to silk fabric production. Globally, India ranks as the second-largest silk producer in the world. In 2021-22, the total raw silk production in the country reached 34,923 metric tonnes, with Mulberry silk contributing the largest share at 74.03% (25,853 MT). This was followed by Eri silk at 21.07% (7,359 MT), Tasar silk at 4.17% (1,456 MT), and Muga silk at 0.73% (255 MT). The industry serves as a key driver for socio-economic upliftment, particularly in rural areas, due to its ability to provide sustainable income, employment generation, and economic empowerment to marginal and small-scale farmers (Sreenivasa & Hiriyanna, 2014) [20]. Its low investment, high returns, and short gestation period further make it an ideal enterprise for rural livelihoods (Sujatha, *et al*. 2015) [1].

In India, significant advancements have been made in sericulture technology, particularly in the production and protection of mulberry crops and silkworms. These innovations have paved the way for a shift from cross-breed silk production to bivoltine hybrid silk, enabling better quality silk to compete in global markets (Meenal, 2008) [13]. However, the adoption of new sericultural technologies is influenced by various socio-economic factors, including education, age, and financial resources, which directly impact cocoon yield and farmer income (Priyadarshini & Vijayakumari, 2013) [17].

Jammu and Kashmir, endowed with a favorable climate, has a rich history of sericulture dating back to 1892. The state was once a leading silk producer in India but now ranks fifth among traditional silk-producing states (Anonymous, 2003) [2]. Despite its decline in cocoon production, the state remains a vital contributor, producing approximately 1,000 MT of cocoons annually, and sericulture continues to be a significant livelihood source for over 30,300 families (Anonymous, 2017a) [3]. The quality of cocoons produced in Jammu and Kashmir is comparable to those from advanced sericulture countries such as China and Japan, further underscoring the potential of this sector.

Anantnag district, especially the Kothar area, has traditionally been a significant contributor to the state's sericulture industry. In the 1980s, the region produced 41,088 kg of cocoons, and despite challenges, it continues to sustain over 330 sericulture families who generate substantial income from the activity (Anonymous, 2017b) [4]. Sericulture in Kothar remains integral to the rural

economy, not just as a source of income but also as a culturally embedded practice. However, challenges such as limited landholdings, lack of technology adoption, and inadequate support systems have hindered the full realization of the region's potential (Hajam, *et al*. 2021) [10].

The socio-economic characteristics of sericulture farmers, such as education, landholding, family size, and access to extension services, play a pivotal role in the adoption of improved practices and the overall success of sericulture. Studies have highlighted the correlation between these factors and farmers' knowledge and income levels, emphasizing the need for targeted interventions to bridge gaps in technology adoption and resource management (Geetha *et al*., 2001; Vijay &Mech, 2020) [8, 23].

This study, focused on the Kothar area of Anantnag district, aims to analyze the personal and socio-economic demographics of sericulture farmers. By examining parameters such as age, education, income, landholding, experience, the study seeks to provide insights into the factors influencing sericulture practices in the region. Additionally, it aims to understand the socio-economic impact of sericulture on farmers and identify strategies to enhance their livelihoods.

Material and Methods

This study was conducted to explore the socio-economic dynamics of sericulture farmers in the Kothar area of Anantnag district, Jammu and Kashmir. The methods employed for this research are detailed below:

Locale of the Study

The research was carried out in the Kothar zone of Anantnag district, known for its extensive sericulture activities. The district lies at an altitude of 5,300 feet above mean sea level, with a majority rural population engaged in agriculture practices.

Sampling Design

Proportionate allocation method was usedto select respondents. Out of 106 villages in the Kothar zone, 45 were identified for having active mulberry cultivation and silkworm rearing practices. These villages were grouped into 8 beats: Sheikhpora, Brisnu, Brimmar, Bariangan, Pushru, Nowgam, Rampora, and Dethu. A total of 120 silkworm rearers were sampled proportionately from these beats based on their population in each beat.

Research Design

The study employed an ex-post facto research design, focusing on analyzing the present socio-economic status of sericulture farmers as influenced by pre-existing factors.

Data Collection Tools and Techniques

A well-structured interview schedule was developed to gather data on the respondents' socio-economic profile. The schedule was pre-tested in a non-sampled area and revised for clarity and efficiency. Data were collected through personal interviews conducted in the local language (Kashmiri) to ensure accuracy and comfort for the respondents.

Variables and Their Measurement: The study analyzed 11 independent variables, measured as follows:

1. **Age:** Respondents' chronological age was categorized into three groups: young (up to 35 years), middle-aged (36-60 years), and old (above 60 years).
2. **Education:** Formal education levels were measured in years of schooling and classified as illiterate, primary, middle, and matric levels.
3. **Family Size:** Total family members were categorized into small (up to 5 members), medium (6-10 members), and large (above 10 members).
4. **Land Holding:** Total land owned by respondents was measured in kanals and grouped into small (up to 14 kanals), medium (15-29 kanals), and large (30-44 kanals).
5. **Area Under Mulberry:** Land dedicated to mulberry cultivation was measured and categorized into low (0-0.88 kanals), medium (0.89-1.77 kanals), and high (above 1.77 kanals).
6. **Occupation:** Respondents' main occupations, contributing more than 50% of income, were categorized into agriculture, sericulture, livestock, business, and combinations thereof.
7. **Annual Income:** Total family income from all sources was grouped into three categories: low (₹15,000-₹70,000), medium (₹70,001-₹1,25,000), and high (above ₹1,25,000).
8. **Experience in Sericulture:** The number of years engaged in silkworm rearing was classified into two categories: up to 22 years and above 23 years.
9. **Sources of Information:** Respondents' exposure to communication media like radio, TV, newspapers, and exhibitions was scored as low, medium, or high.
10. **Extension Contacts:** Frequency of interaction with extension personnel was scored as low, medium, or high based on the degree of contact.
11. **Scientific Orientation:** Measured using a scale developed by (Supe 2007) [22], respondents were classified as having low, medium, or high scientific orientation based on their total scores.

Statistical Analysis

The collected data were analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation.

Results and Discussion

Age

Age, referring to the chronological years completed by the respondent at the time of the interview, plays a significant role in influencing their activity levels, ideas, and behavior. Young respondents tend to be more active and adaptable, while middle-aged respondents show greater stability in ideas and behavior. Older respondents, on the other hand, are often more reluctant to accept changes and tend to be slower in adapting. The data presented in Table 1 indicates that 45.00% of the silkworm rearers were in the middle-age category, followed by 41.66% in the young age group, and 13.33% in the old age group. These findings are consistent with (Hadimani *et al*. 2017) [9], who found that 56.00% of respondents were middle-aged, 22.00% were young, and 21.00% were old. According to their study, middle-aged farmers were more enthusiastic, had higher working

efficiency, and demonstrated a greater capacity to bear risks compared to their younger and older counterparts. These results align with (Philip, 2015) [16], who reported an average respondent age of 42 years, with 72.00% of respondents falling within the 31-55 age group, 8% below 30 years, and 10% above 55 years.

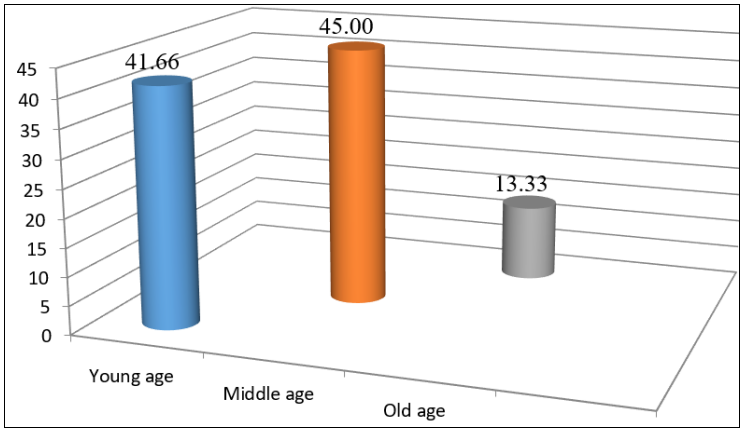

Fig 1: Distribution of the respondents according to their age

Table 1: Distribution of the respondents according to their age, N=120

S. No.	Category	Frequency	Percentage
1	Young age	50	41.66
2	Middle age	54	45.00
3	Old age	16	13.33
	Total	120	100.00
Mean=46.46; S.D.=15.28			

Education: Education plays a vital role in enhancing the standard of living and provides opportunities for improving the socio-economic status of individuals. It is a process that brings desirable changes in behavior and fosters development. Understanding the educational status of respondents was considered important for this study. The data in Table 2 reveals that 55.00% of the respondents were illiterate, 16.66% had primary-level education, and 20.00% had education up to the middle school level. A small proportion, 8.33%, were educated up to matriculation, and no respondents possessed higher education beyond this level. These findings align with the results reported by (Hadimani *et al*. 2017) [9], (Kumar *et al*. 2020) [12], (Vijay *et al*. 2020) [23]. The high illiteracy rate and lack of higher education may be attributed to limited access to education during childhood, family responsibilities, financial constraints, and lack of support from family members. Despite these challenges, sericulture continues to provide a sustainable livelihood for farmers, as it is deeply rooted in traditional practices and does not necessarily depend on formal education. This underscores the importance of sericulture as an inclusive activity that supports individuals with varying levels of literacy and skill.

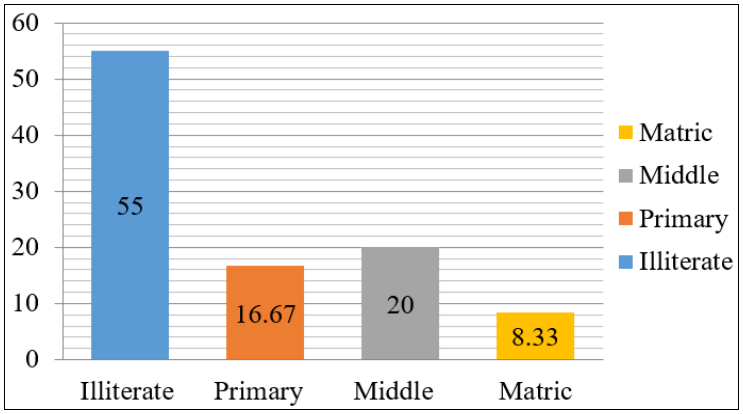

Fig 2: Distribution of the respondents according to their education

Table 2: Distribution of the respondents according to their education, N=120

S. No.	Education level	Frequency	Percentage
1	Illiterate	66	55.00
2	Primary	20	16.67
3	Middle	24	20.00
4	Matric	10	08. 33
	Total	120	100.00
Mean=0.8197; S.D.=1.0287			

Family Size

The data presented in Table 3 indicates that 59.16% of the respondents had a medium family size of 6-10 members, followed by 31.67% with a small family size of up to 5 members. Only 9.17% of the respondents reported having a large family size of more than 10 members. The predominance of medium family sizes may be attributed to the changing social dynamics in rural areas, where nuclear families are becoming more common due to factors such as

land fragmentation, the high cost of living, educational expenses for children, and evolving livelihood patterns. The shift towards smaller families could also reflect an increasing awareness of the benefits of limiting family size to ensure better living conditions, particularly among literate households. These findings are consistent with the results reported by (Dhruw, 2008) [6], who found that 50% of respondents had medium-sized families (6-10 members) and 44.16% had small families (up to 5 members). Similarly, studies by (Sannappa *et al*. 2008) in Maddur Taluk and Malavalli Taluk of Mandya district revealed that 56% and 48% of respondents, respectively, had medium-sized families, while smaller family sizes were observed in 34% and 32% of cases, and larger families in 10% and 20% of cases. These observations suggest a clear trend towards medium-sized families in sericulture farming communities, driven by socio-economic factors that influence family structures and lifestyles in rural areas.

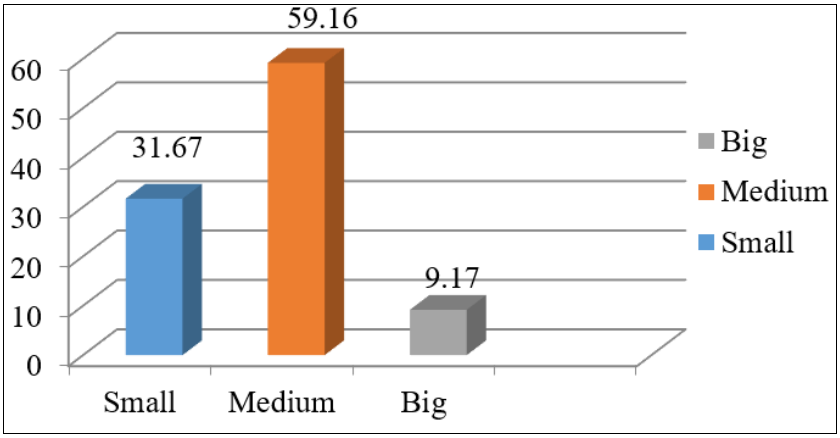

Fig 3: Distribution of the respondents according to their family size

Table 3: Distribution of the respondents according to their family size, N=120

S. No.	Category	Frequency	Percentage
1	Small	38	31.67
2	Medium	71	59.16
3	Big	11	09.17
	Total	120	100.00
Mean=7.014; S.D.=2.605			

Land Holding

Landholding plays a crucial role in determining an individual's capacity to bear risks, adopt innovations, and invest in agricultural practices. It is generally observed that larger landholdings enable better knowledge, adoption of improved practices, and higher income from farming. Therefore, landholding was considered an essential variable in the present study. The data presented in Table 4 indicates that the majority (93.33%) of respondents had small landholdings of up to 14 kanals, followed by 5.00% with medium-sized landholdings (15-29 kanals) and only 1.66% with large landholdings (30-44 kanals). This indicates that most respondents were marginal farmers with landholdings of less than one hectare. A probable reason for this could be the continuous process of land fragmentation in rural areas, where ancestral land is divided among family members across generations. These findings align with those of (Mir, 2013) [14], who reported that 83.67% of respondents in his study had marginal landholdings of less than one hectare. Similar observations were made by (Hatibaruah *et al*. 2022) [11], who noted that most respondents were small and marginal farmers with limited operational land due to generational land fragmentation. Despite small landholdings, sericulture remains a viable livelihood option for these farmers. As a cash crop, sericulture can significantly contribute to the economic upliftment of marginal and small farmers by providing an additional income source and supporting their livelihood sustainability.

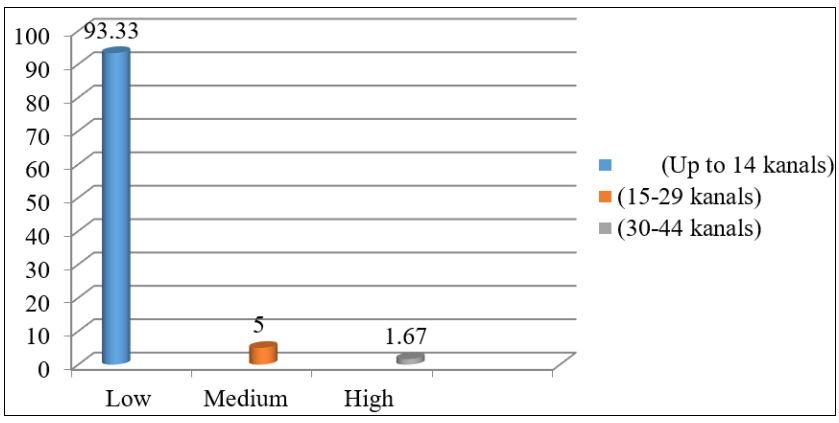

Fig 4: Distribution of the respondents according to their land holding

Table 4: Distribution of the respondents according to their land holding, N=120

Sl. No.	Land Holding	Frequency	Percentage
1	Low (Up to 14 kanals)	112	93.33
2	Medium (15-29 kanals)	6	05.00
3	High (30-44 kanals)	2	01.67
	Total	120	100.00
Mean=5.488; S.D.= 6.017			

Area Under Mulberry

The data presented in Table 5 reveals that the majority of respondents (72.50%) had very small or no land under mulberry cultivation (0 to 0.88 kanals), followed by 18.33% with 0.89 to 1.77 kanals and only 9.16% with 1.77 kanals or more. This indicates that mulberry cultivation is not a primary focus for most farmers, likely because silkworm rearing is considered a subsidiary occupation that does not provide significant income due to various constraints. These findings are consistent with (Mir, 2013) [14], who reported that 81.67% of respondents in his study fell under the very low category of land allocated for mulberry cultivation.

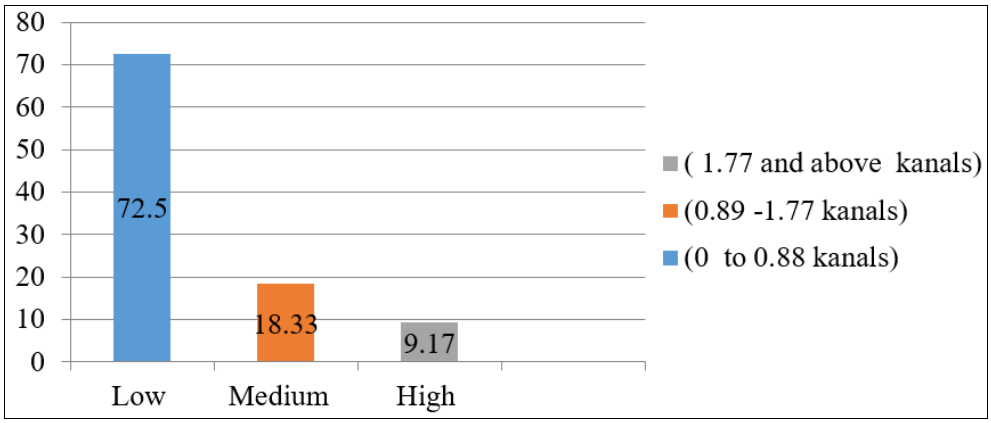

Fig 5: Distribution of the respondents according to their land under mulberry

Table 5: Distribution of the respondents according to their land under mulberry, N=120

S. No.	Land Holding	Frequency	Percentage
1	Low (0to 0.88 kanals)	87	72.50
2	Medium (0.89 -1.77 kanals)	22	18.33
3	High (1.77 and abovekanals)	11	09.17
	Total	120	100.00
Mean=0.6371; S.D.=0.6512			

Occupation

Occupation, defined as the primary activity providing income, serves as an important indicator of an individual's socio-economic status. The data presented in Table 6 shows that the majority (68.34%) of respondents were engaged in a combination of agriculture, sericulture, and livestock & dairying as their primary occupation. This was followed by 14.16% who combined agriculture and sericulture, and 7.50% who relied on sericulture and labor as their main sources of income. Smaller proportions of respondents reported occupations such as agriculture, horticulture, sericulture, and livestock combined (5.00%), or combinations involving business and sericulture (less than 1%). The predominance of agriculture alongside sericulture and livestock suggests that agriculture remains the primary source of livelihood, with sericulture serving as a supplementary activity. These findings align with those of (Geetha, 2010) [7] and (Hadimani *et al*. 2017) [9], highlighting the integral role of agriculture and allied activities in supporting rural households.

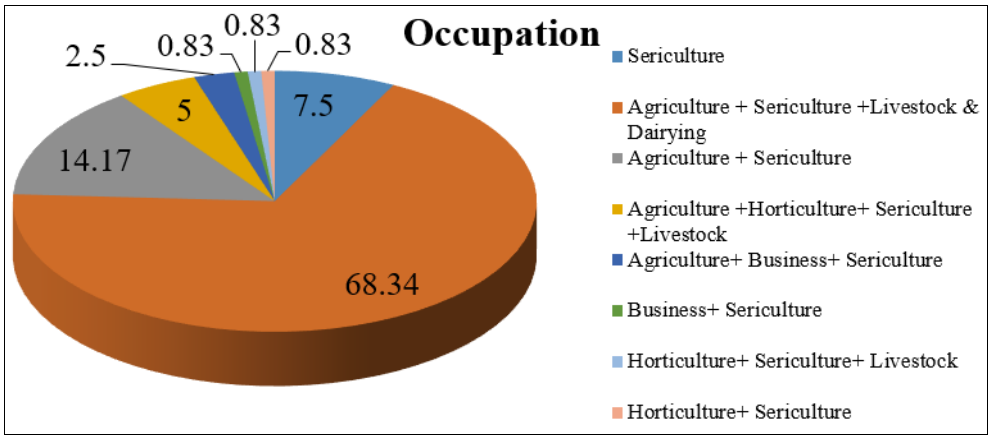

Fig 6: Distribution of the respondents according to their family occupation

Table 6: Distribution of the respondents according to their family occupation, N=120

S. No.	Category	Frequency	Percentage
1	Sericulture + Labourer	09	07.50
2	Agriculture + Sericulture +Livestock & Dairying	82	68.34
3	Agriculture + Sericulture	17	14.17
4	Agriculture +Horticulture+ Sericulture +Livestock	06	05.00
5	Agriculture+ Business+ Sericulture	03	02.50
6	Business+ Sericulture	01	00.83
7	Horticulture+ Sericulture+ Livestock	01	00.83
8	Horticulture+ Sericulture	01	00.83
	Total	120	100.00
Mean=7.410S.D.= 2.064			

Annual Incomes

Annual income, defined as the total income earned by a respondent's family from all sources during the operational year, is a key determinant of economic status and living standards. As shown in Table 7, the majority (80.83%) of respondents had a low annual income of up to ₹0.7 lakh, followed by 15.00% with medium income ranging from ₹0.7-1.25 lakh, and only 4.16% with a high annual income exceeding ₹1.25 lakh. The prevalence of low income levels may be attributed to the respondents' rural background, where limited income-generating opportunities exist, and most families rely primarily on agriculture. These findings are consistent with (Dar *et al*. 2009), who reported that average household income in similar settings ranged from ₹2,500 to ₹3,500 per month.

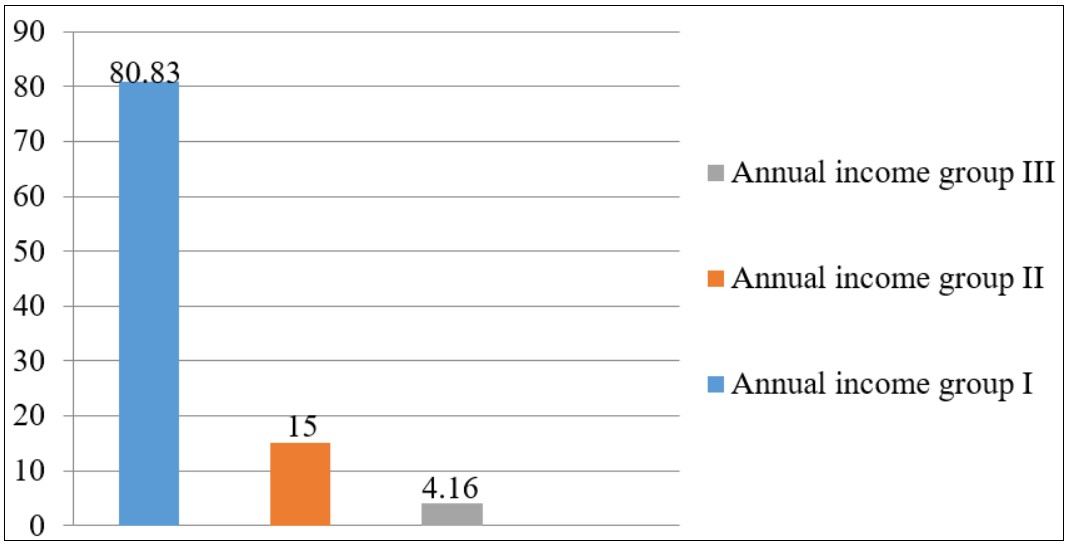

Fig 7: Distribution of the respondents according to their annual income

Table 7: Distribution of the respondents according to their annual income, N=120

S. No.	Category	Frequency	Percentage
1	Annual income group I (Rs 15000 to Rs 70000)	97	80.83
2	Annual income group II (Rs 70001 to Rs 125000)	18	15.00
3	Annual income group III (above Rs 125000)	5	04.16
	Total	120	100.00
Mean=58713; S.D=64870			

Experience in Sericulture

The majority of silkworm rearers had substantial experience in sericulture, with 72.50% having up to 22 years of experience, while 27.50% had more than 23 years. This can be attributed to the respondents' middle-aged demographic, as farming experience often correlates with age. The findings align with (Baqual *et al*. 2014) [5], who reported that 74.33% of respondents had up to 15 years of experience, 19.67% had 15-30 years, and only 6% had 30-45 years of experience in sericulture. The study also observed that sericulture has been a long-standing practice in the region, often passed down through generations. As a household activity predominantly managed by women, many individuals begin learning sericulture skills at a young age, contributing to their extensive experience in the field.

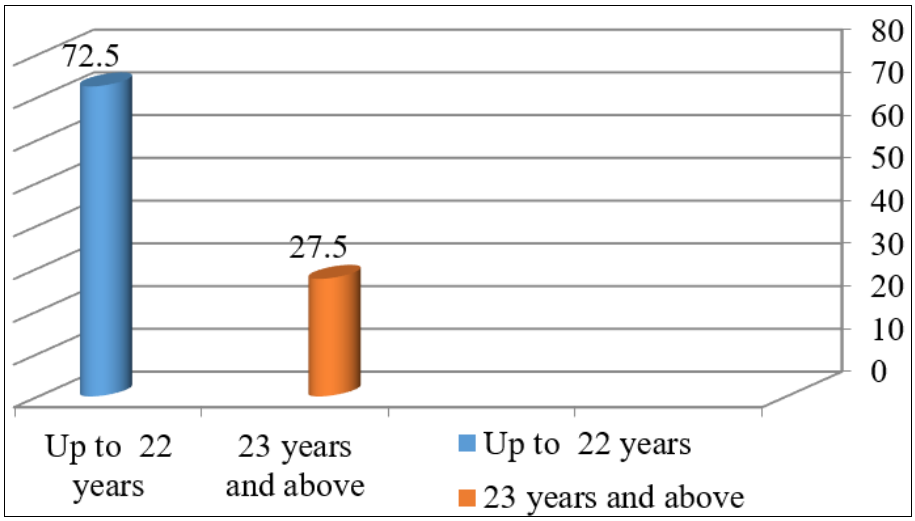

Fig 8: Distribution of the respondents according to their Experience in sericulture

Table 8: Distribution of the respondents according to their Experience in sericulture, N = 120

S. No.	Category	Frequency	Percentage
1.	Up to22 years	87	72.5
2.	23 years and above	33	27.5
	Total	120	100.00
Mean=15.24; S.D. 12.88			

Sources of Information

Sources of information include exposure to various media such as radio, television, newspapers, magazines, farm publications, universities, sericulture departments, agricultural exhibitions, and Kissanmelas for obtaining knowledge on sericulture practices. The data presented in Table 9 reveals that the majority (62.50%) of respondents had low exposure to such sources, followed by 33.33% with medium exposure, and only 4.16% with high exposure. This limited exposure can be attributed to the high illiteracy rate among respondents, restricting their ability to access printed materials and other educational resources. These findings are consistent with (Mir *et al*. 2015) [15], who reported that 58.67% of respondents had low exposure to mass media, 34% had medium exposure, and only 7.33% had high exposure. Limited information access underscores the need for targeted interventions to improve awareness and knowledge among silkworm rearers.

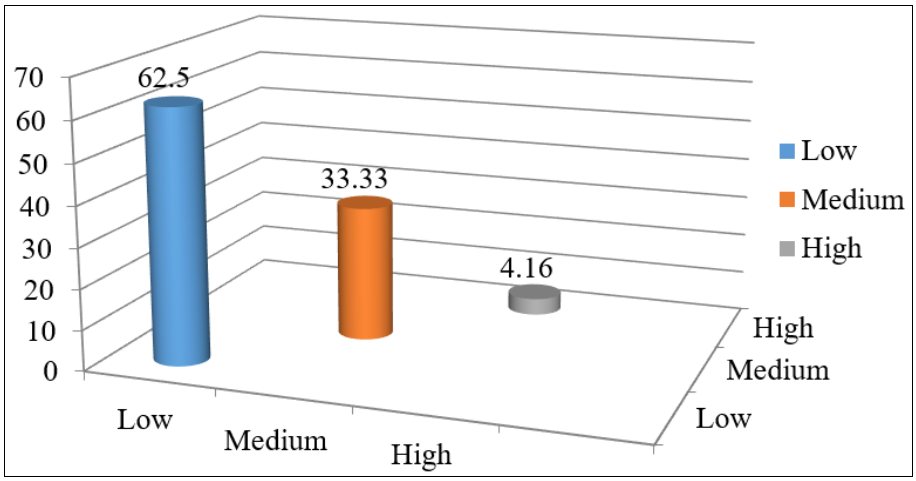

Fig 9: Distribution of the respondents according to exposure to the sources of information

Table 9: Distribution of the respondents according to exposure to the sources of information, N=120

S. No.	Category	Frequency	Percentage
1	Low	75	62.50
2	Medium	40	33.33
3	High	5	04.16
	Total	120	100.00
Mean=2.098; S.D. =1.393			

Extension Contacts

Extension contact refers to the interaction between respondents and extension functionaries for acquiring knowledge and support related to sericulture practices. The data in Table 10 shows that the majority (90.00%) of respondents had a medium level of extension contact, followed by 9.16% with a high level and 0.83% with a low level of contact. These findings suggest that most respondents maintain regular yet moderate interaction with extension personnel. The results are consistent with those of (Hadimani *et al*. 2017) [9], who reported that 62.00% of respondents had medium extension contact. Similarly, (Sunildutt and Chole 2002) [21] observed that 46.25% of

respondents exhibited a medium level of extension contact. In contrast, (Girish *et al*. 2020) found that 50.55% of respondents had low extension contact, 31.12% had medium contact, and 18.33% had high contact. These findings highlight the importance of enhancing extension services to improve awareness and adoption of sericulture practices.

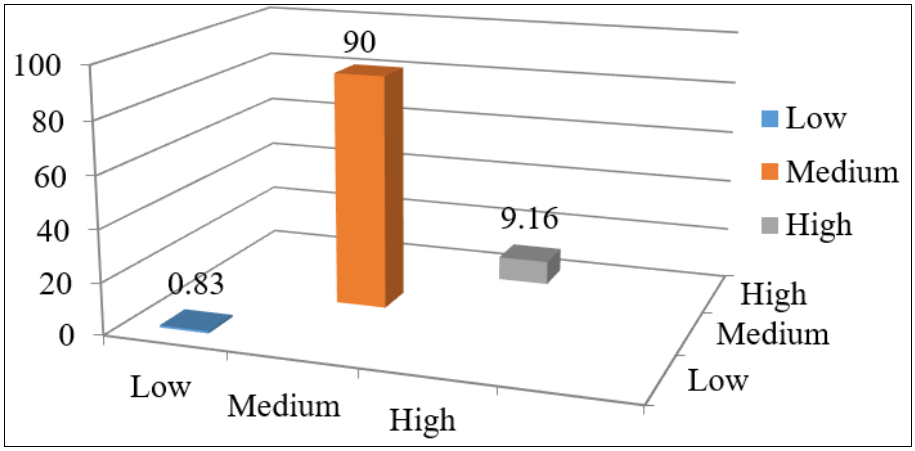

Fig 10: Distribution of the respondents according to their contact with extension functionaries

Table 10: Distribution of the respondents according to their contact with extension functionaries, N=120

S. No.	Category	Frequency	Percentage
1	Low	1	0.83
2	Medium	11	90.00
3	High	108	09.16
	Total	120	100.00
Mean =5.737; S.D. =1.066			

Scientific Orientation

The data presented in Table 11 indicates that the majority (67.50%) of respondents exhibited a medium level of scientific orientation, followed by 20.83% with a high level and 11.67% with a low level. This trend could be attributed to the fact that most respondents were middle-aged with moderate farming experience, which likely influenced their practical understanding and application of scientific practices. These findings align with (Hadimani *et al*. 2017) [9], who reported that 54.00% of respondents had medium scientific orientation, while 30.00% and 16.00% had low and high scientific orientation, respectively. This suggests a need for targeted efforts to enhance scientific orientation among silkworm rearers to improve the adoption of advanced sericulture practices.

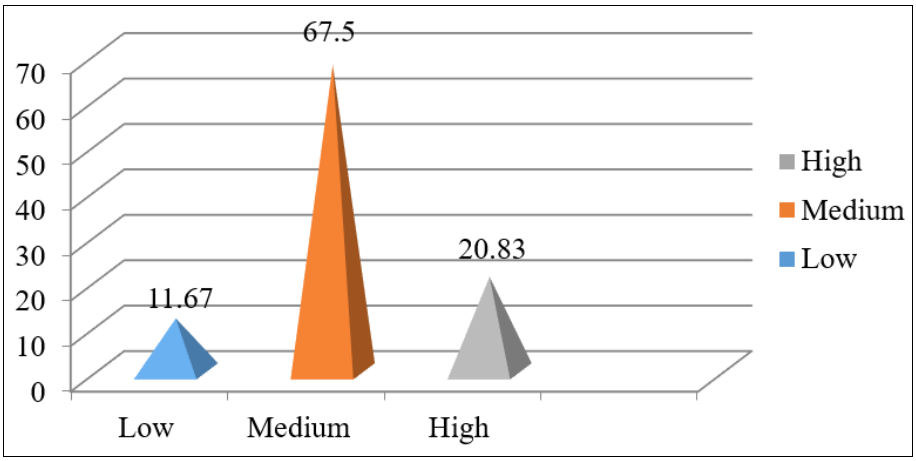

Fig 11: Distribution of the respondents according to their scientific orientation

Table 11: Distribution of the respondents according to their scientific orientation N=120

S. No.	Category	Frequency	Percentage
1	Low	14	11.67
2	Medium	81	67.50
3	High	25	20.83
	Total	120	100.00
Mean = 14.45; S.D. = 3.18			

Conclusion

The study provides a comprehensive understanding of the socio-economic and demographic profile of sericulture farmers in the Kothar area of Anantnag district, Jammu and Kashmir. The findings reveal that the majority of respondents are middle-aged, with a medium level of farming experience and scientific orientation, reflecting their adaptability and stability in adopting sericulture practices. However, a high illiteracy rate and limited exposure to information sources remain significant challenges, hindering the adoption of advanced sericulture technologies. Most farmers are engaged in agriculture, sericulture, and livestock activities as primary income

sources, with small landholdings and limited areas under mulberry cultivation. Despite these limitations, sericulture continues to serve as an essential livelihood option, offering sustainable income for marginalized and small-scale farmers. The study highlights the need for targeted interventions, such as capacity building programs, improved extension services and access to educational resources to enhance knowledge, productivity and income levels in the sericulture sector. Strengthening these areas can bridge existing gaps and enable farmers to leverage their resources more effectively, contributing to the revival and growth of sericulture in the region. By addressing socio-economic constraints and encouraging the adoption of innovative practices, sericulture can continue to play a pivotal role in uplifting rural livelihoods and supporting the regional economy.

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