

PROBLEMS FACED BY SERICULTURISTS IN THE CULTIVATION OF MULBERRY AND REARING OF SILKWORMS IN CHANNAPATTANA TALUK OF RAMANAGARA DISTRICT OF KARNATAKA.

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ABSTRACT

As we know, Sericulture plays a significant role in agro- based rural industries in the economy. It is labour intensive activity and provides employment throughout the year. Sericulture is no more a subsidiary activity in agriculture. It has paved the way for socio-economic development with low investment and higher returns in the short period. Income is generated at a regular interval throughout the year unlike other perennial horticultural crops or agricultural crops. Sericulture involves the nurturing of silkworms and the production of cocoons spun for the preparation of silk based final products. Sericulture focuses mainly on the production of food plant of silkworms i.e. mulberry. This plant is used to feed the silkworms.

Karnataka is pioneer in mulberry silk production and ranks first in the production of mulberry cocoon and silk production in the country. The present study was carried out in Ramanagara district of Karnataka which is one of the traditional silk growing district in the state. A sample of 90 sericulturists was selected randomly to document problems faced them in the cultivation of mulberry and rearing of silkworms. The problems faced by sericulturists were shortage of irrigation water and labours, erratic supply of power and insect pests menace and high cost of chemical fertilizer. Similarly, rearing of silkworms was constrained by insects, shortage of skilled labour, prevalence “Sunna” and “Sappe” diseases, Uzi fly, etc.

Keywords: Sericulture, Silkworms, Agriculture, Economic, Labours

1. INTRODUCTION

Sericulture plays a significant role in agro- based rural industries in the economy. It is a labour intensive activity and provides employment throughout the year. Sericulture is no more a subsidiary activity in agriculture. It has paved the way for socio-economic development with low investment and higher returns in the short period. Income is generated at a regular interval

throughout the year unlike other perennial horticultural crops or agricultural crops. It is the potential sector of the agriculture to raise economic status of the farming community and also earning foreign revenue (Thapa and Shrestha, 1999). Sericulture is best suited for improving the rural economy of the country with strong potential to create jobs (Anitha,2011). It was revealed that the role of women in sericulture is remarkable and it helps to eradicate the unemployment problem among the rural women (Parimala (2009). Sericulture is an agro based industry, involving different types of operation, sericulture acts an interface in transferring wealth from richer section to poorer sections of the society. Silk is consumed mostly by the affluent and the money so spend by them on purchase of silk is distributed among the sericulturists, reelers, weavers, and traders (Rajeswari and Victoria Devi, 2008).

There are 58 countries on the world map of silk; bulk of it is produced in China and India, followed by Japan, Brazil and Korea (Nagaraju, 2008). Sericulture plays a very effective role in the utilization of the natural resources in a most effective manner for socio-economic upliftment with livelihood, employment and income generation (Malik *et al.*, 2008). In India, Karnataka is a leading state in the country in terms of area under mulberry as well as mulberry cocoon and silk production. Karnataka had 19492 ha of area under mulberry plantation and produced 9671 Mt of raw silk during 2016-17. Karnataka shared more than 42 per cent of the mulberry area and about 45 per cent of the total raw silk production in India. Sericulture is an important cottage industry in Karnataka. Sericulture which was considered as a subsidiary occupation in the past is being considered as major activity. Sericulture sector provides employment opportunities about 10.67 lakh rural, semi- urban people and 1 hectare of mulberry cultivation provides yearlong continuous employment in the state. The importance of sericulture in rural economy of Karnataka can be judged from the area under mulberry and cocoon production during 2015-16 (Table 1)

Table 1: Importance of Sericulture in Karnataka

Sl. No.	Particulars	Karnataka State
1	Area under Mulberry (ha)	87597
2	Cocoon Production (tonnes)	70436.14
3	No. of Villages Engaged in Mulberry cultivation	10805
4	No. of Farmers Engaged in Occupation	123310
5	Value of Silk Produced (Rs in Lakh)	213648.18

Source: GoK, 2016, Karnataka at a Glance

The productivity and quality of silk is conditioned by the food/feed material. Silkworms feed on mulberry leaves and hence cultivation of mulberry and production of good quality, succulent leaves is most important for harvesting good better quality and higher cocoon yields. Thus, the success of sericulture as a viable commercial crop largely depends on the production of quality mulberry leaf and its conversion into cocoons at an economic cost.

Success of sericulture depends on quality silkworm eggs. Therefore, management of seed production, interalia transportation and incubation play important role on overall return. To produce quality seed, it is very important to adopt scientific methods of egg production right from seed crop rearing to egg incubation. Mulberry leaf quality, productive silkworm hybrids, quality silk worm seeds and rearing techniques are the important factors that contribute to successful silkworm cocoon crop.

The profitability of sericulture depends on many factors such as quality of mulberry leaves, disease free layings/ silkworms, temperature, technology adopted in raising mulberry as well as rearing of silkworm, hygiene, transport facilities, marketing facilities and prices of inputs and outputs.

2. OBJECTIVE

The objective of the present study was to identify the problems faced by sericulturists in the cultivation of mulberry and rearing of silk worm for cocoon production by eliciting opinions of sericulturists.

3. METHODOLOGY

The study was carried out in Channapattana taluk of Ramanagara district of Karnataka which is one of the traditional silk growing district in the state. A sample of 90 sericulturists was selected randomly to document problems faced by them in the cultivation of mulberry and rearing of silkworms. Primary data were collected using survey method during the year 2016-17. The problems associated with cultivation of mulberry and rearing of silkworm for cocoon production has been presented considering age and education of the sericulturist.

4. HYPOTHESIS

We hypothesized that problems faced sericulturists differs across age groups as well as with the level of education.

5. RESULTS

Since, our study is about the problems faced by sericulturists in the cultivation of mulberry and rearing of silkworms based on age and education levels, we present the brief details about age and education of the sample sericulturists.

General Characteristics of Respondents

5.1. Age of Respondents

Age of the farmer is important determinant in agriculture as it brings in more experience in cultivation. The average age of sample farmers is around 50 years (48.64). About 36.67 per cent of the respondents are in the age group of 51 to 60 years followed by 30 per cent in 41 to 50 years age group (Table 2). It is interesting to note that less than 6 (5.56) per cent of the respondents are less than 30 years old as against 11 per cent of the respondents are more than 60 years old.

Table 2: Profile of Respondents based on Age

Sl. No.	Age group (Years)	Percentage
1	≤ 30	5.56
2	31 to 40	16.67
3	41 to 50	30.00
4	51 to 60	36.67
5	> 60	11.11
Total		100 (90)*
Average Age (years)		48.64

*Number of sample farmers

5.2. Education Levels

Education is important attribute which facilitates the access to new technology and cultivation practices. It is expected that better educated farmers would reap better returns by adopting improved cultivation and rearing practices for raising mulberry and rearing silkworms for cocoon production.

It can be seen from Table 3 that most of the sericulturists (54 per cent) are illiterate. A little more than 15 per cent of the respondents have formal education up to middle school and another 18 per cent up to high school level and less than 5 per cent of the respondents have graduate degrees.

Table 3: Profile of Respondents based on Education

Sl. No.	Education Level	Percentage
1	Illiterate	54.44
2	Up to middle school	15.56
3	High school	17.78
4	PUC	6.67
5	Graduate	4.44
6	Post Graduate	1.11
Total Samples		100.00 (90)*

*Number of sample farmers

5.3. Problems Faced by Sericulturists in Cultivation of Mulberry by Age Group

It can be seen from Table 4 that little more than one quarter (26.67 per cent) of the farmers indicated labour and water shortage as the main problem followed by 23.33 per cent reporting water shortage as the main constraint. Insect and pests problem is highlighted by nearly 18 per cent of the sericulturist (Fig 1). Surprisingly, irregular power supply is reported by less than 9 per cent of the respondents.

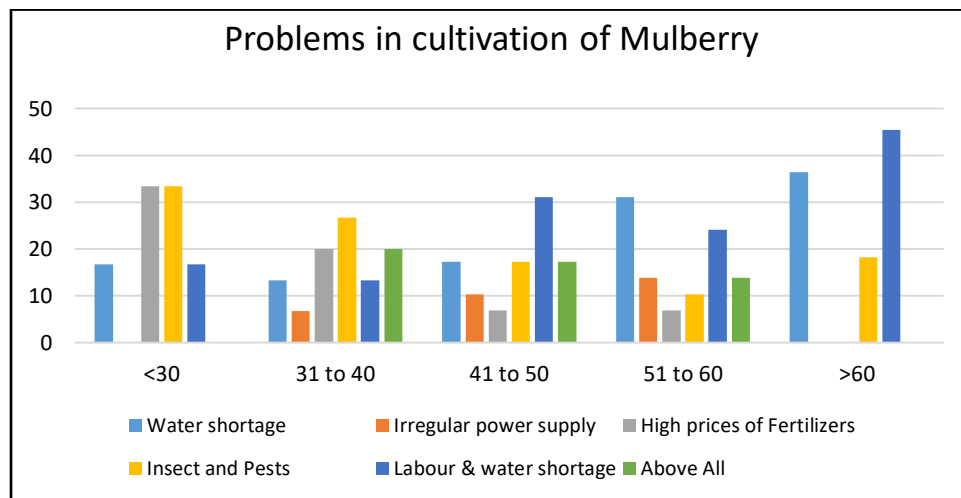
Table 4: Problems Faced by Sericulturists in Cultivation of Mulberry by Age Group

In Percent

SL. No	Problems	Age Group in Years					Total
		<30	31 to 40	41 to 50	51 to 60	>60	
1	Water shortage	16.67	13.33	17.24	31.03	36.36	23.33
2	Irregular power supply	0.00	6.67	10.34	13.79	0.00	8.89
3	High prices of Fertilizers	33.33	20.00	6.90	6.90	0.00	10.00
4	Insect and Pests	33.33	26.67	17.24	10.34	18.18	17.78
5	Labour & water shortage	16.67	13.33	31.03	24.14	45.45	26.67
6	Above All	0.00	20.00	17.24	13.79	0.00	13.33
	Total	100 (6)	100 (15)	100 (29)	100 (29)	100 (11)	100 (90)

Sericulturists below the age of 40 years are found more concerned about insect/ pest problem and high prices of chemical fertilizers when compared with their older counterparts. Respondents older than 50 years of age reported water shortage as well as labour and water as the important problem faced by them in the cultivation of mulberry.

Fig. 1: Problems faced in the cultivation of Mulberry by Age Group



Todmal, et al (2013) in their study on “Constraints faced by farmers in adoption of sericulture production technology” in Ahmednagar district of Maharashtra found that the constraint faced by sericulturists were shortage of irrigation water, lack of labours, insufficiency of capital high cost of chemical fertilizer, lack of knowledge about of bio-fertilizers, lack of information about application of VAM, lack of information about concentration of the bed disinfectant and rearing house disinfectant, whereas suggestions were fertilizers should be provided at subsidized rates, chemical fertilizers and other required chemicals should be made timely available, knowledge should be providing regarding use of bio-fertilizer and VAM, in time credits at lower interest rates should be provided. Dodamani, M. T., et al (1997) observed that incidence of pest and diseases as well as shortage of irrigation water were the major problems in mulberry cultivation in Gulbarga district.

5.4 Problems Faced by Sericulturists in Cultivation of Mulberry by Education Level

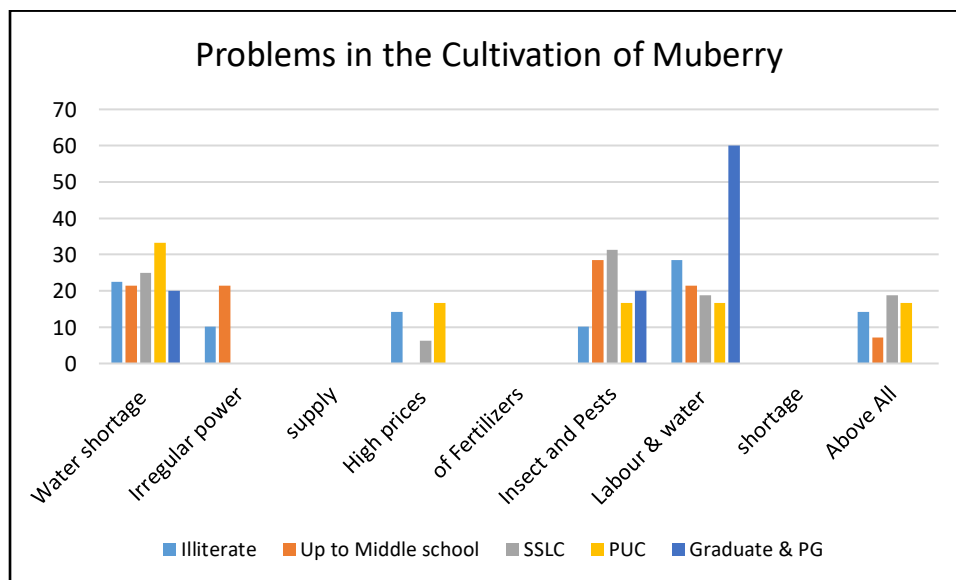
About 28.57 per cent of the illiterate expressed labour and water shortage and another 22.45 per cent of the illiterates opined water shortage as the main problem in raising mulberry plantations (Table 5, Fig. 2). On the contrary, 60 percent of the graduate and post graduate level educated sericulturists expressed labour and water shortage as the main impediment in the cultivation of

mulberry. Insect / pest menace is has been reported as a major problem by 29 and 31 per cent of the sericulturists having middle school and high school level education, respectively.

Table 5: Problems Faced by Sericulturists in Cultivation of Mulberry by Education Level
In percent

SL. No	Problems	Education Levels					Total
		Illiterate	Up to Middle school	SSLC	PUC	Graduate & PG	
1	Water shortage	22.45	21.43	25.00	33.33	20.00	23.33
2	Irregular power supply	10.20	21.43	0.00	0.00	0.00	8.89
3	High prices of Fertilizers	14.29	0.00	6.25	16.67	0.00	10.00
4	Insect and Pests	10.20	28.57	31.25	16.67	20.00	17.78
5	Labour & water shortage	28.57	21.43	18.75	16.67	60.00	26.67
6	Above All	14.29	7.14	18.75	16.67	0.00	13.33
	Total	100.00 (49)	100.00 (14)	100.00 (16)	100.00 (6)	100.00 (5)	100.00 (90)

Fig. 2: Problems faced in the cultivation of Mulberry by Education Level



5.5. Problems Faced by Sericulturists in Rearing of Silkworms by Age Group

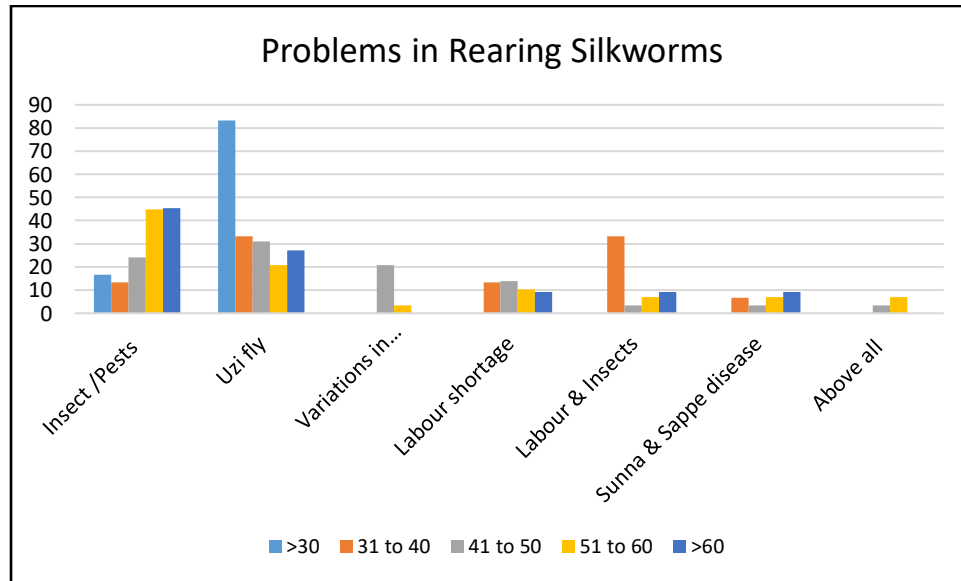
It can be seen from Table 6 and Fig. 3 that 31 per cent of all the respondents each identified insect/ pests and Uzi fly as the major problem in rearing silkworm cocoon for cocoon production. Among the respondents below 30 years of age, about 83 per cent of the respondents experienced Uzi fly is the main problem in rearing silkworms whereas, 45 per cent of the respondents above 50 years of age identified insect/pests as the main problem in rearing silkworm for cocoon production. Shortage of skilled labour is reported by 9 per cent to 14 per cent of the respondent in various age groups except those below 30 years.

Table 6: Problems Faced by Sericulturists in Rearing of Silkworms by Age Group

In Percent

SL. No	Problems	Age Group in Years					Total
		>30	31 to 40	41 to 50	51 to 60	>60	
1	Insect /Pests	16.67	13.33	24.14	44.83	45.45	31.11
2	Uzi fly	83.33	33.33	31.03	20.69	27.27	31.11
3	Variations in Temperature	0.00	0.00	20.69	3.45	0.00	7.78
4	Labour shortage	0.00	13.33	13.79	10.34	9.09	11.11
5	Labour & Insects	0.00	33.33	3.45	6.90	9.09	10.00
6	Sunna & Sappe disease	0.00	6.67	3.45	6.90	9.09	5.56
7	Above all	0.00	0.00	3.45	6.90	0.00	3.33
	Total	100	100	100	100	100	100
		(6)	(15)	(29)	(29)	(11)	(90)

Fig. 3: Problems Faced by Sericulturists in Rearing of Silkworms by Age Group



5.6. Problems Faced by Sericulturists in Rearing of Silkworms by Education Level

Insect/Pests and Uzi fly were the major problems for most of the respondents among various levels of education. However, majority (60 per cent) of the respondents with graduate and post graduate education indicated Uzi fly as the major problem in rearing of silkworms in Channapattana taluk (Table 7, Fig 4). Similarly, 16 to 20 per cent of the respondents having studied PUC and more indicated all the problems mentioned in the schedule.

Table 7: Problems Faced by Sericulturists in in Rearing of Silkworm by Education Level

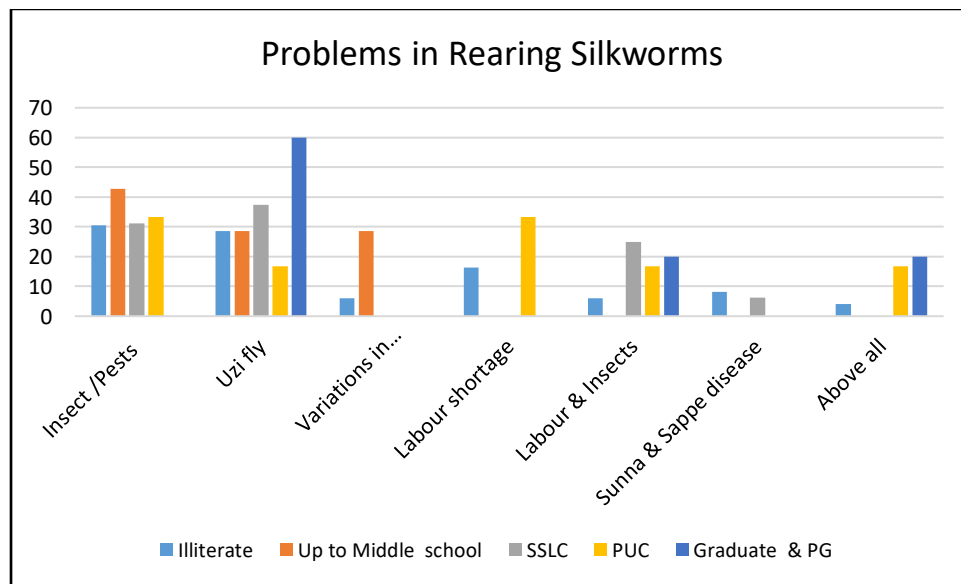
In Percent

SL. No	Problems	Education Levels					Total
		Illiterate	Up to Middle school	SSLC	PUC	Graduate & PG	
1	Insect /Pests	30.61	42.86	31.25	33.33	0.00	31.11
2	Uzi fly	28.57	28.57	37.50	16.67	60.00	31.11
3	Variations in Temperature	6.12	28.57	0.00	0.00	0.00	7.78
4	Labour shortage	16.33	0.00	0.00	33.33	0.00	11.11
5	Labour &	6.12	0.00	25.00	16.67	20.00	10.00

	Insects						
6	Sunna & Sappe disease	8.16	0.00	6.25	0.00	0.00	5.56
7	Above all	4.08	0.00	0.00	16.67	20.00	3.33
	Total	100.00 (49)	100.00 (14)	100.00 (16)	100.00 (6)	100.00 (5)	100.00 (90)

Surprisingly, less than 4 per cent of all the respondents reported Sunna and Sappe disease as a constraint in rearing silkworm in the study area. Dodamani, et al (19917) observed that the sericulturist faced totally nine types of problems in rearing of silkworms four of them related to pests and diseases and rest of them related to availability of inputs, infrastructure and climate. Of the various problem high temperature during summer months was the major problem followed by attack by Uzi fly was the next major problem. Grasserie, Flacherie and Mascardine diseases were reported by 27, 21 and 12 per cent of the sample respondents .Non-availability of separate rearing room as well as non-availability of disease free layings were the other problems expressed by the sample sericulturists from Gulbarga.

Fig.4: Problems Faced by Sericulturists in Rearing of Silkworms by Education Level



CONCLUSION

The sericulturists from Channapattana faces various problem in the cultivation of mulberry as well as in rearing of silkworm for the production of cocoon. Shortage of labour and water for irrigation followed by insect/pests menace were identified as major problems in the cultivation of

mulberry. Similarly, insect/pest and Uzi fly were experienced as major constraints in rearing silkworms for cocoon production. As expected, the problems experienced in raising mulberry plantation as well as in the rearing of silkworms for cocoon production varied across age groups as well as level of education.

The shortage of water for irrigation can be address by sensitizing mulberry growers and shifting from furrow or flood irrigation to drip or sprinkler irrigation system. Shoot system of mulberry cultivation and rearing, which is extensively followed in Japan, is a notable one. In this method shoot cut along with leaf is fed to the silkworms on large rearing racks instead of the individually picked leaves reducing labor cost by 60%. Following the paired row system, it is also possible to partially or fully mechanize the plantation. Separate garden for young age rearing (it is generally called Chawki rearing) ensures a healthy crop as the early age rearing is very critical from the nutrition and sanitation point of view.

Different races and hybrids of the monophagous silkworm *Bombyx Mori* produce the major portion of silk in India. The gene pool available in the country can be broadly divided into two groups, low yielding stocks characterized by high adaptability to varying conditions and highest yielding stocks exhibiting regular diapause, suffer from the low adaptability to the highly variable agro climatic conditions. To increase productivity and quality of silk there is an urgent need to develop area /region specific technology for sericulture. The Department of sericulture has to strengthen the extension efforts and train the sericulturists in management of various pests and diseases to reap the maximum benefits from sericulture.

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