

Sericulture – An Ideal Enterprise for Sustainable Income in Erode District of Tamil Nadu

K. Prakasam & Dr. G. Ravi

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Abstract

Sericulture is one of the rural-based agro industries with global reach. Some unique features of the Sericulture Sector are its rural nature, ecologically and economically sustainable activity for the poor, small and marginal farmers, agricultural labour and women in particular. Sericulture is a labour intensive industry in all its phases. It can generate employment up to 11 persons for every kilogram of raw silk produced. Out of which more than 6 persons are women. In this paper, the cost and return structure of mulberry cocoon production in the major silk producing state in south India namely Erode District in Tamil Nadu are examined, as the stability and sustainability of sericulture enterprise highly depends on its economic viability.

Key words: Sericulture, labour, wages, Tamilnadu

Introduction

Sericulture is one of the rural-based agro industries with global reach. Some unique features of the Sericulture Sector are its rural nature, ecologically and economically sustainable activity for the poor, small and marginal farmers, agricultural labour and women in particular. Sericulture is a labour intensive industry in all its phases. It can generate employment up to 11 persons for every kilogram of raw silk produced. Out of which more than 6 persons are women. The product of sericulture, silk, has social, religious significance in the lives of Indians, since is closely associated with all celebrations of milestones of life in India and South Asia. In addition, sericulture is a very important part of the economics of several states in India such as Assam, Bengal, Karnataka and Tamilnadu. This specialized agricultural industry is also focused on the income and lives of rural women.

Review of Literature

Studies on Costs and Returns of Cocoon Production

Lakshmanan, et al. (2000) compared economic benefits over investment in rearing bivoltine and crossbred cocoons in their study on economics of bivoltine versus cross breed cocoon production in K.R. Nagar taluk of Mysore district. The study revealed that bivoltine rearing earns higher net returns than crossbred production, owing to climatic suitability, skilled man power and technical guidance received from developmental agencies.

Hajare et al (2008) observed that the contribution from sericulture enterprise was found to be highest at 52 percent (Rs 82315/ha/yr) followed by paddy – sun flower (20 percent)

Soybean –wheat (15 percent) and soybean gram (12 percent) in paddy area, where as it was as high as 54 percent followed by cotton – pigeon pea (17 percent) soybean-wheat (16 percent) and soy bean – gram(13 percent) in cotton area and sustained income continued upto 15-20 years.

Objectives of the Study

1. To study growth rate of Production and productivity of Area under mulberry and cocoon production in Tamilnadu from 2000-01 to 2010-11.
2. To analyze the Benefit-Cost ratio of mulberry sericulture for per Acre in Erode District of Tamil Nadu.
3. To identify the S.W.O.T analysis of the Sericulture Industry in the study area.

Hypotheses

1. There is a fluctuation in growth rate of area under mulberry and cocoon production in Tamilnadu.
2. The Sericulturist gets better yield and income per acre per year.

Methodology

This study was carried out in the major silk producing state in India, namely Erode District of Tamil Nadu was selected for data collection based on the area under mulberry and Silkworm Rearing. The Primary data on economic aspects viz., costs and return in cocoon

production were collected and randomly selected from the sample farmers through personal interview method by using pre-test interview schedule for pilot study.

Farmers having two year old established mulberry garden were considered for the study. The secondary data were collected during the period 2000-01 to 2010-11 from sericulture Department in Gobichettipalayam and Erode District of Tamil Nadu. For this Analysis of data, the Growth rate of Trend line and Benefit Cost ratio and co-efficient of variation have been worked out in addition the diagrammatic representations have been drawn.

RESULT AND DISCUSSION

Table - 1

Growth Rate of Area under Mulberry and Cocoon Production in Metric Tones in Tamilnadu from 2000-01 To 2010-2011

Years	Area under mulberry in metric tones as on 31 st march	%	A.G.R (Average Growth rate)	Cocoon Production in metric tones as on 31 st march	%	A.G.R. (Average Growth rate)
2000-01	27651	9.93	-	5138.00	7.54	-
2001-02	23382	8.40	- 15.44	5882.10	8.63	14.48
2002-03	13485.63	4.84	42.32	4005.30	5.87	- 31.91
2003-04	10063.61	3.61	- 25.38	2124.20	3.12	- 46.97
2004-05	12683.05	4.55	26.03	3101.20	4.55	45.99
2005-06	16534.82	5.94	30.37	5224.90	7.66	68.48
2006-07	25107.07	9.02	51.84	7930.50	11.63	51.78
2007-08	35117.42	12.61	39.87	9675.70	14.19	22.01
2008-09	33361.25	11.98	- 5.00	9949.10	14.59	2.83
2009-10	35551.00	12.77	6.56	8587.60	12.59	- 13.68

2010-11	45513.40	16.35	28.02	6568.38	9.63	- 23.51
N=11	X=278450.25	100.00	—	Y=68187.88	100.00	—

Source : Compiled from secondary data

N=11 $x=278450.25$ $Y=68187.88$

The above table 1 analyses the growth rate of area under mulberry and cocoon production in metric tones in Tamilnadu during the period of 2000-01 to 2010-11. According to it the average growth rate for area under mulberry raised from 2004-05 to 2006-07. Due to the effect of both central and state Seri-cultural department, the growth rate of mulberry raised and the usage of mulberry is enormous. Besides feeding to silk worm (Bombox mori), mulberry is used as a food for rearing cattle, stick of the mulberry leaves is used as fire wood and in foreign countries mulberry leaves are used for preparing tea.

The average growth rate of mulberry came down from 2007-08 to 2009-10. This is due to some farmers uprooting the mulberry plant. (i) negative impact of papaya mealy bug disease of pest on mulberry leaves. (ii) fluctuation of cocoon price. and (iii) crop diversification.

Later the growth rate of mulberry raised due to (i) few farmers planting of the mulberry, with the support, encouragement and guidance of sericulture department.

Like-wise the average growth rate of cocoon production increased from 2004 to 2006. But before this period and after this period the average growth rate was negative and the growth rate was declining owing to the following reasons (i) dumping of Chinese silk into our nation; (ii) government reduced import duties on silk and silk goods; (iii) papaya mealy bug disease of pest occurred in Tamilnadu; (iv) Tamil Nadu is the 4th place in mulberry production in India; (v) technical service Centre (Seri-culture department) is not established in many of the district in Tamil Nadu; (vi) Frequent changes in cocoon price; (vii) farmers may not be aware of usage of mulberry and raw silk; (viii) the climate condition which required for mulberry planting and silk worm rearing may not be conducive for all the districts of Tamil Nadu; (ix) scarcity of labour power and so only they have used family labour.

Figure - 1

The Growth rate of Area under mulberry and Cocoon Production in metric tones of Tamilnadu

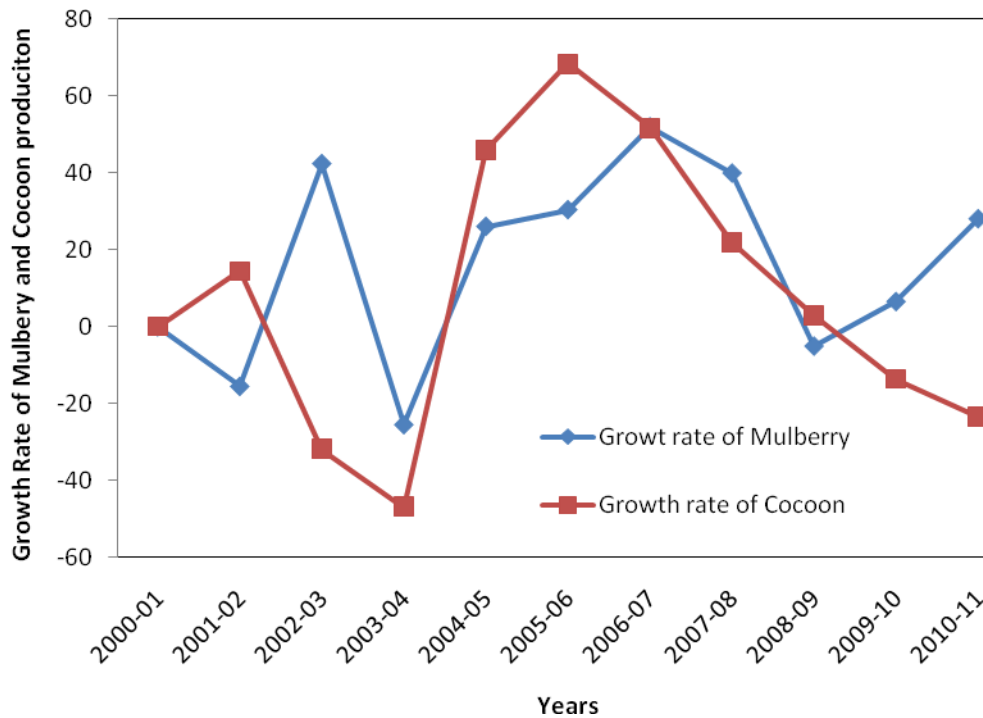


TABLE - 2

Productivity Per (Ha) for Area Under Mulberry Cultivation and Cocoon Production from 2000-01 to 2010-11 in

**Tamil
Nadu**

Years	Area under mulberry (Ha) in metric tones	Cocoon Production in metric tones	Productivity of cocoon (kg/Ha) \bar{X}	$\bar{x} - 252.86$
2000-01	27651	5138.00	185.82	- 67.04
2001-02	23382	5882.10	251.57	- 1.29
2002-03	13485.63	4005.30	297.01	44.15
2003-04	10063.61	2124.20	211.08	- 41.78
2004-05	12683.05	3101.20	244.52	- 8.34
2005-06	16534.82	5224.90	315.99	63.13
2006-07	25107.07	7930.50	315.87	63.01
2007-08	35117.42	9675.70	275.52	22.66
2008-09	33361.25	9949.10	298.22	45.36

2009-10	35551.00	8587.60	241.56	-11.3
2010-11	45513.40	6568.38	144.32	-138.54
N=11	278450.25	68187.88	2781.48	- 268.29 + 238.31
			$\Sigma AP = 2781.48$	- 29.98

Source : Compiled from secondary data

$$N=11, \bar{X} = 2781.48 \quad \bar{x} = 252.86 \quad \sigma = 9.04$$

$$\bar{x} = \frac{\sum AP}{n} = \frac{2781.48}{11} = 252.86$$

$$\sigma = \frac{\sqrt{\sum(\bar{x} - \bar{x})^2}}{n} = \sqrt{\frac{(-29.98)^2}{11}} = \sqrt{81.71} = 9.04$$

$$\sigma = 9.04$$

$$C.V = \frac{\sigma}{\bar{x}} \times 100 = \frac{9.04}{2781.48} \times 100 = 0.33$$

$$C.V = 0.33$$

The above Table 2 highlights the productivity per (Ha) for area under mulberry cultivation and cocoon production in Tamilnadu from 2000-01 to 2010-11 periods. The productivity of cocoon in kilo gram fluctuated year to year. This is due to (i) crop diversification (ii) fluctuation of cocoon price (iii) scarcity of manpower and (iv) proper guidance and support of technical service centre (Sericulture department) to new cultivators of mulberry and cocoon bearers. The average productivity of cocoon in kilo gram and co-efficient of variation have been worked out, i.e. 252.86 and 0.33 respectively. The variation is meager in percentage 0.33% when the productivity of cocoon production is consistent and vice versa.

Figure - 2
Productivity per/kg/ Ha for Area Under Mulberry Cultivation and Cocoon Production in
Tamil Nadu

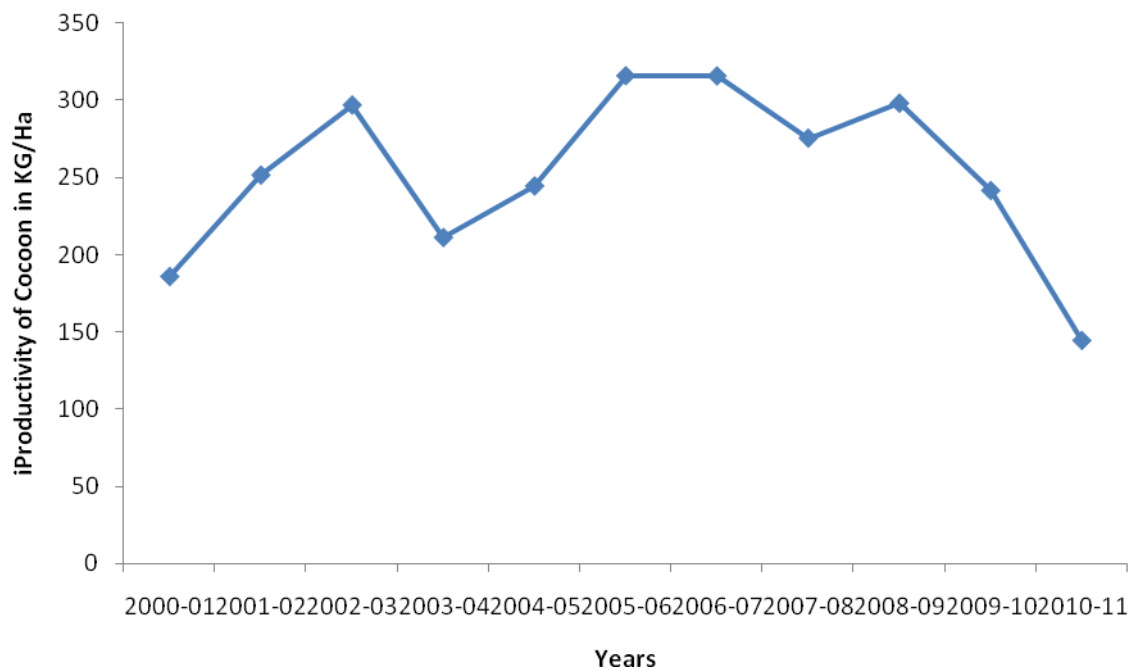


Table No. - 3
Costs of Mulberry leaf production (Rs/acre/year)

S.No.	Items	Tamil Nadu	
		Cost	%
A	Operational Cost		
1	Bullock	-	-
2	Labour	5494.47	14.46
3	Farmyard Manure	8743.22	23.01
4	Fertilizers	7076.87	18.63
5	Irrigation Water	5859.09	15.42
6	Plant Protection Chemical	3576.87	9.41
7	Other Costs	3437.90	9.05
8	Interest on Working Capital	2159.42	5.68
	Total Variable Cost	36347.84	95.66
B	Fixed Costs	-	-
1	Apportioned Cost of Establishment of Mulberry garden	1647.88	4.37
	Total Leaf production cost	37995.72	100.00

Source: Compiled from primary data

The above table no 3 has been analysed by the details of cost of cultivation of mulberry garden per acre per year. Cocoon production involves two distinct activities namely mulberry leaf production, which is the food for silk worm, and silk worm rearing. Therefore, the cost of production of mulberry leaf and silk worm rearing to produce cocoon were separately worked out. The total cost of leaf production was Rs.37,995.72 per acre per year in Tamil Nadu. Among the cost components, farmyard manure and fertilizers were the major items amounting to Rs.15,820.09 per year, which accounted for 23.01% and 18.63% respectively in the total cost of mulberry leaf production.

Mulberry being a perennial crop, the costs incurred on establishment of mulberry garden was apportioned to the economic life span of mulberry garden which was considered as 15 years and accounted as fixed costs in working out the cost of mulberry. The fixed costs was estimated to Rs.1,647.68, i.e. 4.34% of the total cost.

Table No.4
Costs in Silkworm rearing (Rs./acre/year)

S.No.	Items	Tamil Nadu	
		Cost in Rs.	%
	Average number of Disease Free Layings reared	1079.33	
A	Variable costs		
1	Leaf	37995.72	35.09
2	DFLs / Chawkiworms	8702.68	8.04
3	Disinfectants	8472.29	7.82
4	Materials	960.76	.89
5	Labour	35320.42	32.62
6	Hiring charges of mountages	-	-
7	Transportation and marketing	4862.40	4.49
8	Interest on working capital	864.30	.80
9	Total variables costs	97178.57	89.74
B	Fixed Cost		
	Depreciations on building and equipments	11107.11	10.26
	Total Cost (A +B)	108285.68	100
	Cost / K.g. Cocoon	134.58	-

Source: Compiled from primary data

The above table no. 4 has been worked out by the details of the expenditure incurred on different items in silkworm rearing in Erode District of Tamil Nadu. The Tamil Nadu farmers reared more number of eggs (1079.33 DFLs/acre/Year). The total cost of production of cocoon was estimated to Rs.1,08,285.66 in which the variable costs accounted for 89.74%. Among the cost components, leaf was the major items in silkworm rearing, which amounted to Rs.37,995.72

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representing 35.09% of the total cost of cocoon production in Tamil Nadu, followed by leaf, labour were the major cost component, which constituted 32.62% (Rs.35,320.42) of the total cost of cocoon production in Tamil Nadu. As the Tamil Nadu farmers used the mountages owned by them for spinning of silkworm larvae to form cocoon. They did not incur any expenditure on this head. The other variable cost components include transportation and marketing charges, interest on working capital and material costs for cocoon production.

The cost of one kg. of cocoon production was worked out to Rs.134.58.

Table No.5
Revenue from cocoon production (Rs/acre/year)

S.No.	Items	Tamil Nadu
		Revenues
1.	Average Cocoon yield (k.g./100 DFLs)	74.55
2.	Average Cocoon Price (Rs./Ks)	224.47
3.	Cocoon Production (K.g)	804.62
4.	Total Income from Cocoon	1,80,613.05
5.	Income from by products	7486.97
6.	Total Revenue	188100.02
	Total Cost	108285.68
	Net Return	79814.34
	B.C. Ratio	1.74

Source: Compiled from primary data

The above table No. 5 has been shown by the calculation of net revenues from cocoon production in Erode Area of Tamil Nadu. The sample farmers of Tamil Nadu in Erode area attained an average cocoon yield of 74.55 kg / 100 DFLs and their cocoon fetched an average price of Rs.224.47/kg. Thus the total income from cocoon has been arrived at of Rs.1,80,613.05 from 804.62 kg. of cocoon production.

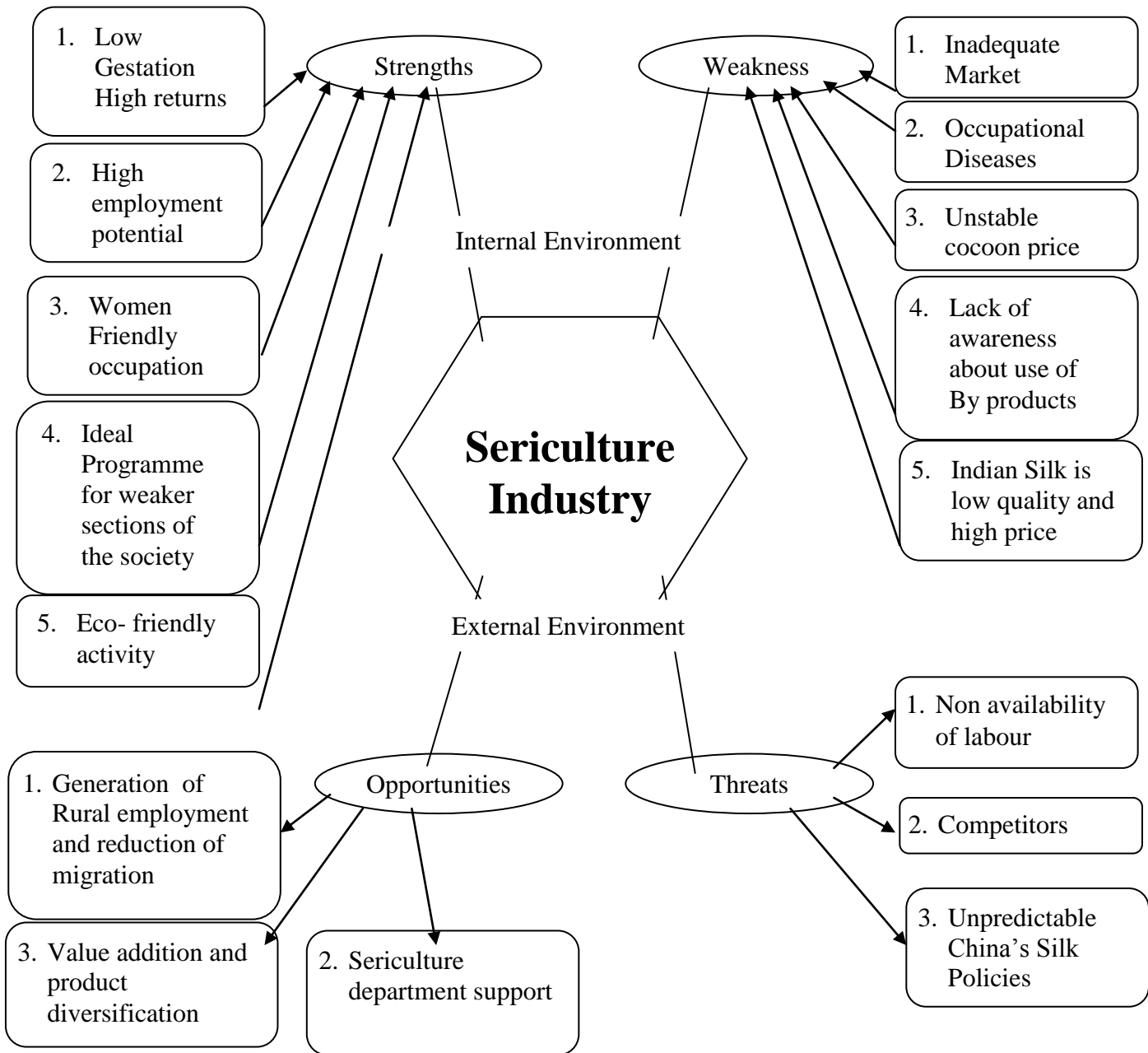
The gross revenue, which includes the revenue from sales of cocoon and value of by products generated, worked out to Rs.1,88,100.02. The Tamil Nadu farmers obtained the net revenue of Rs.79,814.34 acre/year. The Benefit Cost ratio was worked out to 1.74 in mulbems cocoon production of Tamil Nadu. From this analysis, the second hypothesis has been verified by Benefit – Cost ratio, i.e. the mulberry silkworm rearing is a highly profitable agro based enterprises. Hence, it has been accepted.

Figure 3. for SWOT Analysis in Sericulture Industry

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- ❖ The average growth rate of both mulberry and cocoon production came down from 2007-08 to 2009-10 due to negative impact of papaya mealy bug disease of pest which occurred on mulberry leaves.
- ❖ The average productivity of cocoon in kilogram is 252.86 in Tamil Nadu.
- ❖ The farm yard manure and fertilizers costs are major component in total cost of mulberry cultivation, i.e. 23.01% and 18.63% respectively.
- ❖ The leaf and labour costs are the major components in total cost of silk worm rearing, i.e. 35.09%. and 32.62% respectively.
- ❖ An average cocoon price is Rs./Kg is 224.47
- ❖ The benefit – cost ratio is to 1.74.

Problems of the mulberry sericulture in the study area

1. The shortage of labourers it was difficult to carryout the sericultural operations as silkworm rearing is labour intensive enterprise.
2. During the summer there was shortage of irrigation water for mulberry garden which inturn reduced mulberry yield thus reducing the number of DFL reared.
3. Fluctuations in cocoon prices.
4. Absence of strict discase control measure.
5. Prevalence of old technologies
6. Poor grading system of cocoons
7. Manipulation by the intermediaries in the trade of raw silk.
8. Lack of efforts to increase area.
9. Decline in the area under mulberry and fluctuations in its production.
10. Failure to capture internal market due to poor quality.

Conclusion

In India, sericulture is not only a traditional but also a living culture. It is a farm-based, labour intensive and commercially attractive economic activity falling under the cottage and small scale sector. It particularly suits rural – based farmers, entrepreneurs and artisans as it rearing low investment, but, with potential for relatively high returns. It provides income and

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employment to the rural poor, especially, farmers with small land holdings and the marginal land holding and weaker sections of the society. Several socio-economic studies have affirmed that the benefit-cost ratio in sericulture is the highest among comparable agricultural crops.

Policy Implications

1. Extension agents should give more importance in Educating farmers about better protection measures and proper disinfection methods.
2. Farmers should be educated about optimal use of labour.
3. Introduce high yielding mulberry varieties.
4. Quality – based pricing should be given.
5. Provide assistance to producers to shift to bivoltine silk.
6. Adopt clusters of villages for better marketing conditions.
7. Impose anti-dumping duty.
8. Implement silk mark in strict manners.
9. Develop pest management measures against various pests of mulberry and silkworm.
10. The farmers must be encouraged to adopt recommended practices and technology to the full extent.

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