



## ECONOMICS OF SERICULTURE AND PROCESSING OF COCOONS IN KURNOOL DISTRICT OF ANDHRA PRADESH

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**ABSTRACT**

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Sericulture is the cultivation of silk through rearing of silk worm. It involves series of activities like mulberry cultivation, cocoon production, silk reeling and the products in different forms. It is a farm-based, labour intensive and commercially attractive economic activity. This study aims to know the profitability of mulberry cultivation and cocoon production by using primary data collected from 60 farmers of Kurnool district of Andhra Pradesh. The cost of mulberry cultivation per hectare worked out to be ₹ 1,07,015.5 for rearing of 2939.65 Disease free Laying (DFLs). The gross income on selling of mulberry leaves and stalks (by product) amounts ₹ 1,20,233.99. So it is not profitable to cultivate mulberry for selling of leaves instead one could rear the silk worm by purchasing leaves, but availability of mulberry leaves during all times is not assured. The cost of rearing 2939.65 DFLs worked out to be ₹ 3,46,115.58 and returns amounts ₹ 7,12,620.94. The B-C ratio of cocoon production was 1.19.

**KEYWORDS:** DFLs, sericulture, cost and returns, marginal farms, small farms, pooled farms.

### INTRODUCTION

Sericulture is a cottage industry of par excellence. It is one of the most labor intensive sectors of the Indian economy combining both agriculture and industry, which provides for means of livelihood to a large section of the population i.e., mulberry cultivator, co-operative rearer, silkworm seed producer, farmer-cum rearer, reeler, twister, weaver, hand spinners of silk waste, traders etc. It is the only one cash crop in agriculture sector that gives returns within 30 days. Sericulture is the cultivation of silk through rearing of silkworms. It involves the raising of food for silkworm, rearing of silkworm for production of cocoons, reeling and spinning of cocoon for production of yarn etc, for value added benefits such as processing and weaving. Sericulture has been important income generating cottage based industry in the country since ancient period (Subrata and Kunal, 2005). Sericulture is successfully practiced as viable rural industry for two reasons. Firstly, it gives remunerative employment to family labour throughout the year and secondly, it ensures periodic income even to the marginal and small holding. From the individual rearer point of view, sericulture is the most remunerative cash crop as compared to any other crop.

### MATERIAL AND METHODS

For the purpose of analysing costs and returns in mulberry cultivation and cocoon production, the list of mulberry farmers were stratified into marginal and small and pooled farms on the basis of their size of operational holding, and each size stratum were selected based on probability proportion to size. Thus ten marginal, 50 small farmers constitute the total sample for the study, i.e total sample of farmers 60 farmers were interviewed for reference period 2015-16 by using pre-tested questionnaire. The primary data required for the study was collected from the selected farm households on the family size, land holdings, inventory of implements and machinery, costs and returns of mulberry cultivation and cocoon production through personal interview using pre-tested structured schedule. Similarly, Dyavappa *et al.* (2016) estimated the economics of mulberry cultivation and cocoon production in non-traditional areas, where the cost of cultivation procedure is little bit different than other cultivation practices. Cost of cultivation of mulberry production was calculated by working out the establishment cost of mulberry garden which is amortized and used for calculating the maintenance cost.

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**Table 1. Cost of maintenance of mulberry garden**

		<b>(Rupees per hectare per year)</b>		
<b>S. No.</b>	<b>Item</b>	<b>Marginal</b>	<b>Small</b>	<b>Pooled</b>
I.	Operational Costs			
1.	Human labour	67,630 (62.16)	64,085 (60.59)	65,885 (61.56)
	Owned	36,122.5 (33.17)	31,632.5 (29.91)	33,850 (31.63)
	Hired	31,507.5 (28.99)	32,452.5 (30.68)	32,035 (29.93)
2.	Tractor power			
	Owned			
	Hired	3,128 (2.87)	2,856 (2.70)	2,992 (2.79)
3.	Manures and Fertilisers	11,464.67 (10.52)	12,748.77 (12.09)	11,919.37 (11.16)
	a. Manures	8,700 (7.99)	10,404 (9.88)	9,552 (8.95)
	b. Fertilisers	2,764.67 (2.53)	2,344.77 (2.21)	2,367.37 (2.21)
4.	Pesticides	739.20 (0.67)	703.50 (0.66)	712.40 (0.66)
5.	Electricity chargers	2,012.25 (1.84)	1,772.75 (1.67)	1,798.5 (1.68)
6.	Interest on working capital	6,794.92 (6.24)	6,573.28 (6.21)	6,664.58 (6.22)
	Total Operational Costs	91,772.04 (84.30)	88,739.30 (6.21)	89,971.85 (84.07)
II	Fixed costs			
1.	Land revenue	187.50 (0.17)	187.50 (0.17)	187.50 (0.17)
2.	Rental value of owned land	8,000 (7.34)	8,000 (7.56)	8,000 (7.47)
3.	Depreciation	303.12 (0.27)	283.25 (0.26)	295.67 (0.27)
4.	Interest on fixed capital	849.06 (0.79)	847.07 (0.82)	848.31 (0.80)
	Total fixed costs	9,339.68 (8.57)	9,317.82 (8.81)	9,331.48 (8.71)
III	Apportioned establishment cost	7,773.48 (7.13)	7,690.06 (7.27)	7,711.21 (7.20)
	Total costs	1,08,885.2 (100)	1,05,747.18 (100)	1,07,015.5 (100)

Note: Figures in parentheses indicate percentages to total costs

**Table 2. Yield and returns from mulberry cultivation per hectare per year**

S. No.	Particulars	Marginal	Small	Pooled
1	Yield of leaves (in kg)	72,310.72	70,542.36	71,326.54
2	Stalks (by product in quintals)	13.26	11.59	12.12
3	Income from leaves (₹)	1,19,312.7	1,16,394.89	1,17,688.79
4	Income from by product (₹)	2,784.6	2,433.9	2,542.20

## RESULTS AND DISCUSSION

Cost of cultivation of mulberry for marginal, small and pooled farmers in Kurnool district was worked out to be ₹ 1,08,885.2 and ₹ 1,05,747.18 and ₹ 1,07,015.5 per hectare. The share of operational costs was remained 84.30, 83.93 and 84.09 per cent and remaining 15.7, 16.07 and 84.09 per cent accounted for fixed cost on marginal, small and pooled farmers. Among the operational costs, the cost on human labour shared a highest proportion (62.16, 60.59 and 61.56%) to the total cost at ₹ 67,630, ₹ 64,085 and ₹ 65,885 on marginal, small and pooled farmers per hectare (Table1). Murthuza (1985) reported human labour was most important component in mulberry cultivation contributing to 37.49 per cent of total cost. The rental value of land was the major item of fixed cost in all farms with a share of 7.34, 7.56 and 7.47 per cent of total cost on respective farms. Over all the total cost of mulberry cultivation, including both operational and fixed cost was estimated at ₹ 1,08,885.2, ₹ 1,05,747.18 and ₹ 1,07,015.5 on marginal, small and pooled farms.

The returns in mulberry cultivation through mulberry leaves, stalks etc were either assumed or imputed ones in nature. This was because leaf was not sold but used by the producer himself in cocoon production and the by-products were wholly used by the farm families themselves. It was observed that respondents produced mulberry leaves primarily for silk worm rearing. Hence, it was difficult to estimate the returns from mulberry cultivation (Table 2). However, in the sample villages, on an average mulberry leaves were sold at ₹ 1.65 per kg. Hence this price was used to arrive at the gross income from mulberry leaves which amounted to ₹ 1,19,312.7, ₹ 1,16,394.89 and ₹ 1,17,688.79 and including the stalks the gross income from mulberry cultivation was ₹ 1,22,097.30 and ₹ 1,18,828.79 and ₹ 1,20,230.99 on marginal, small and pooled farms respectively. The findings of Dyavappa *et al.* (2016) also aptly supported the

findings of the study. The income from marginal farms was highest because of higher usage of planting material, manures and fertilizers which increased the yield of mulberry leaves compared to small and pooled farms.

It is assumed that the unit producing the mulberry leaves is a service unit which produced basic raw material to the cocoon production unit. There is an integration of these activities. Generally 250-300 DFL's required for each hectare of mulberry depending on the quality of mulberry leaves. The cost of silk cocoon production per hectare per year in marginal, small and pooled farms were worked out to be ₹ 3,54,444.8, ₹ 3,38,517.66 and ₹ 3,46,225.58 respectively (Table 3). The share of operational costs in all farms were 99.19, 99.31 and 99.25 per cent and the remaining 0.81, 0.69 and 0.75 per cent were on fixed costs respectively. Among the operational costs, the cost on human labour shared was highest in all farms and accounted 67.60, 64.85 and 66.13 per cent on marginal, small and pooled farms respectively.

Human labour was mainly employed in the indoor activities for feeding, application of disinfectants and cocoon harvesting. The out door activities utilizing labour were land preparation, transportation of FYM, planting, fertilizer and plant protection chemical application, weeding and intercultivation.

Table 4 revealed that, gross and net income from silk cocoons production for rearing of 2,980.22, 2,907.33 and 2,939.65 DFLs resulted on an average of ₹ 7,65,866.12, ₹ 7,59,424.68 and ₹ 7,62,646.64 of gross income and ₹ 4,11,421.32, ₹ 4,20,907.02 and ₹ 3,66,395.36 net income on marginal, small and pooled farms per hectare per year respectively. The cocoon yield from 100 DFL's were 103.28, 104.98 and 104.27 respectively on selected farms. Which appeared significantly high and low when compared with the results of Chandrappa *et al.* (2001) reported in his study that the

**Table 3. Cost of Production of Silk Cocoons (Rupees per hectare per year)**

S. No.	Particulars	Marginal	Small	Pooled
I.	Operational Costs			
1.	Human labour	1,43,510 (40.48)	1,39,907.5 (39.55)	1,38,707.5 (40.05)
	Owned	95,375 (13.580)	85,070 (14.42)	90,325 (26.08)
	Hired	48,135 (13.58)	48,837.5 (14.42)	48,382.5 (13.97)
2.	Chawki centre rearing cost	29,802.2 (8.40)	29,073.30 (8.58)	29,396.50 (8.49)
3.	Mulberry leaves	1,19,312.54 (33.68)	1,16,394.89 (34.38)	1,17,688.79 (33.99)
4.	Disease free layings	20,861.54 (5.88)	20,351.31 (6.01)	20,577.55 (5.98)
5.	Disinfectants	1,908.90 (0.55)	1,554.88 (0.45)	1,731.89 (0.50)
6.	Transportation and marketing of cocoons	2,393.34 (0.67)	1,898.16 (0.56)	2,145.75 (0.61)
7.	Mountages ( Nethrikas)	6,572 (1.88)	7,147 (2.11)	6,859.5 (1.98)
8.	Lighting charges	850 (0.23)	750 (0.22)	800 (0.23)
9.	Repairs and maintenance	300 (0.08)	200 (0.05)	250 (0.07)
10.	Interest on working capital	26,040.85 (7.34)	24,902.16 (7.35)	25,452.59 (7.35)
	Total Operational Costs	3,51,551.53 (99.19)	3,36,179.90 (99.31)	3,43,610.07 (99.25)
II	Fixed costs			
1.	Depreciation of rearing room and equipments	2,630.25 (0.74)	2,125.24 (0.62)	2,377.74 (0.68)
2.	Interest on fixed capital	263.02 (0.07)	212.52 (0.07)	237.77 (0.07)
	Total fixed costs	2,893.27 (0.81)	2,337.76 (0.69)	2,615.51 (0.75)
III	Total costs	3,54,444.8 (0.81)	3,38,517.66 (100)	3,46,225.58 (100)

Note: Figures in parentheses indicate percentages to total costs

**Table 4. Farm Business Analysis of Silk Cocoon Production****(Rupees per hectare per year of Mulberry Garden)**

S. No.	Particulars	Marginal	Small	Pooled
1.	Gross income	7,65,866.12	7,59,424.68	7,62,646.64
2.	Net income	4,11,421.32	4,20,907.02	4,13,186.66
3.	Farm business income	5,07,059.34	5,06,189.54	5,6,983.83
4.	Family labour income	5,06,796.32	5,05,977.02	5,06,564.06
5.	Farm investment income	3,63,549.34	3,66,282.04	3,68,276.33
6.	Gross- ratio	2.16	2.24	2.19
7.	Benefit cost- ratio	1.16	1.24	1.19

average cocoon yields were 52.10 kg for 100 DFL's in shoot feeding method of rearing, and when compared with Dyavappa *et al.* (2016) the average cocoon yield was 200.70, 187.27 and 200.70 kg per 100 DFL's in Belgam, Bagalkot and both districts together.

Marginal farms realized high yield when compared to small and pooled farms because of high usage of DFL's by marginal farms. The return obtained per rupee of investment (B-C ratio) was high on small farms followed by pooled and marginal farms with 1.16, 1.24 and 1.19 respectively (Table 5). Whereas Umesh *et al.* (2001) reported that for every rupee invested in cocoon production the returns obtained of ₹ 1.82 in shoot feeding and Chandrappa *et al.* (2001) reported in his study that the returns per rupee invested was higher at ₹ 1.76. Besides, Rao *et al.* (2001) reported higher cost benefit ratio at ₹ 1:1.70 and 1:1.22 respectively for Chittoor and Eluru areas and Purushotham and Rama Mohana Rao (2009) showed that cost-benefit ratio for sericulture enterprise which was worked out at 1:1.94.

**Table 5. Costs and returns per kg of silk cocoons (in rupees per kg)**

S. No.	Particulars	Marginal	Small	Pooled
1.	Total costs	115.14	110.90	112.94
2.	Gross income	248.80	248.80	248.80
3.	Net income	133.66	137.90	135.86

## CONCLUSION

Sericulture is like Akshayapatra, where in the farmers will be getting a regular monthly income through out the year because it is one month crop. Apart from income it also provides sufficient employment to households and which is mostly less laborious than the field work. When it comes to the study which is clearly indicated that returns was higher in marginal farms because of high yield of cocoons with the usage of high DFLs, farm yard manure, manures and fertilizers. Hence, the Government should take active participation in strengthening the sericulture department with good staff and by providing infrastructure like seed production units and chawki rearing centers, creating market facility which will leads to multiplier effect in the area by giving scope for the associated industries or activities like reeling and weaving etc.

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