

Economic issues in silk cocoon production: a study at farm household level in Southern India

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Abstract

A study was conducted to examine the cost and returns in silk cocoon production at the farm household level in Karnataka, Tamil Nadu and Andhra Pradesh. The field investigation revealed that the per annum cost of cocoon production per acre worked out to Rs. 71635.83 in Karnataka, Rs. 67638.44 in Tamil Nadu and Rs. 49011.07 in Andhra Pradesh. The net return per acre/year was the highest in Tamil Nadu followed by Karnataka and Andhra Pradesh. Suitable extension strategies need to be evolved in view of the increasing cost of cocoon production. Extension workers have to motivate the farmers in adoption of novel technologies in sericulture to increase both productivity and quality of cocoon production.

Introduction

Mulberry sericulture helps to transform the economic livelihood of rural households in India. With the advent of new sericultural technologies, it has become popular due to higher cocoon productivity and lower cost of production (Lakshmanan *et al.*, 1996, 1998, 2002, 2005). This enables the small and marginal farmers to use their limited land resources to cultivate mulberry more intensively under irrigated condition. More so, cost of inputs and cocoon price are eventually subject to change with the demand and supply prospects. Therefore, data on cost of cocoon production and income profile from sericulture has to be studied periodically. Such information would help the farmers to take appropriate decisions on judicious investment in sericulture. Keeping in view the aforesaid aspects, the present study envisages understanding the cost of cocoon production and returns at the household level across different regions in Southern India.

The study has been attempted with the following specific objectives *viz.*,

- (1) To study the cost of cocoon production per acre/year
- (2) To workout the returns from sericulture/acre/year, and
- (3) To suggest policy implications from the study

Methodology

The present study was undertaken in Karnataka, Tamil Nadu and Andhra Pradesh. From each state, 120 sericulturists were randomly selected. The study

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ultimately comprised of 360 respondent farmers for primary data collection. The detailed composition of the sample is appended in Annexure-I. In case of Andhra Pradesh, the selected farmers cultivated mulberry under semi-irrigated condition; while in Karnataka and Tamil Nadu, the cultivation was under assured irrigated condition. The data were collected by direct interview method using a pre-tested schedule. The data on physical units and monetary values of inputs employed in mulberry cultivation and silkworm rearing and value of output were collected during 2005-06. The data were presented on per acre basis. The results were presented under three heads *viz.* cost of mulberry leaf production, cost of silk cocoon production and economic profile of silk cocoon production.

Results and Discussion

Cost of Mulberry Leaf Production

The mulberry leaf, which is the food for silkworms, is being cultivated throughout the year. Establishment of mulberry garden usually needs about 6-8 months, which depends on the availability of resources with the farmers. Once the garden is established, it is expected to yield continuously for about 20 years. The initial investment for raising mulberry is considered to be a fixed cost. The share of establishment cost, which is spread over for 20 years, will be added to the recurring cost of leaf production per annum. Table 1 presents the cost of leaf production for Karnataka, Tamil Nadu and Andhra Pradesh.

Table 1. Cost of Mulberry Leaf Production
(Rupees/acre/year)

S.No.	Resource	Karnataka (n=120)	Tamil Nadu (n=120)	Andhra Pradesh (n=120)
1	Human labour	12516.65 (38.68)	15488.34 (44.18)	8917.70 (36.03)
2	Animal power	2448.60 (7.57)	1999.66 (5.70)	1192.30 (4.82)
3	Farm yard manure	5120.00 (15.82)	5253.26 (14.99)	7580.50 (30.63)
4	Chemical fertilizer	5810.00 (17.95)	4407.20 (12.58)	2819.50 (11.39)
5	Irrigation	2670.50 (8.25)	3803.26 (10.85)	1200.50 (4.85)
6	Land tax	111.05 (0.35)	180.00 (0.52)	49.25 (0.20)
7	Interest (@ 8 % pa)	2294.14 (7.09)	2490.54 (7.10)	1740.78 (7.03)
8	Fixed cost*	1389.12 (4.29)	1432.29 (4.08)	1251.47 (5.05)
	Total cost	32360.06 (100.00)	35054.55 (100.00)	24752.00 (100.00)

Note : * Refers to share of establishment of mulberry garden during 6 months period.
The values in the brackets indicate the percentage of total cost

The item-wise cost of inputs employed in leaf production indicates that, out of total cost incurred, the cost on human labour constituted the highest share in Tamil Nadu (44.18 per cent); followed by Karnataka (38.68 per cent) and Andhra Pradesh (36.03 per cent). Next to human labour, FYM and chemical fertilizer accounted for 30.63 and 11.39 per cent for Andhra Pradesh; 15.82 and 17.95 per cent for Karnataka; and 14.99 and 12.58 per cent for Tamil Nadu. The cost on FYM was high in Andhra Pradesh as compared to other states, since majority of the farmers had resorted to purchasing FYM due to non availability of the same in their villages. Irrigation accounted for 10.85 per cent of the total cost in Tamil Nadu, 8.25 and 4.85 per cent in Karnataka and Andhra Pradesh, respectively. Further, it is observed that an average cost of Rs. 35054.55 was being incurred in the production of mulberry leaf, in Tamil Nadu; whereas for Karnataka and Andhra Pradesh, it was Rs. 32360.06 and Rs. 24752.00 respectively. The cost of leaf production varies across the regions of the states due to the prevailing different social and economic conditions among the farmers.

Cost of Cocoon Production

Like mulberry leaf production, silkworm rearing is also an year round activity. It is estimated that 5-6 crops can be harvested during one year. For each crop, inputs such as human labour (engaged for shoot feeding, cleaning, harvesting and marketing), seeds (Dfls) and materials (lime powder, bleaching powder, senitech, vijtha, uzi powder, news paper etc) are to be applied to rear silkworms.

Table 2 presents the cost details on cocoon production during a one-year period by the sample farmers across the three states. It is evident that in Tamil Nadu, out of the total cost of cocoon production (Rs.37638.44), the cost of mulberry leaf alone accounted for 51.83 per cent (Rs. 35054.55); followed by human labour (Rs. 11178.43), dfls (Rs. 5918.32), material (Rs. 4105.25) and marketing (Rs. 1855.75). The fixed cost of production in silkworm rearing includes depreciation of rearing house and appliances. It was estimated at Rs. 7830 per year (shared 11.58 per cent of total cost of production) for Tamil Nadu.

Table 2. Cost of Cocoon Production
(Rupees/acre/year)

S.No.	Resource	Karnataka (n=120)	Tamil Nadu (n=120)	Andhra Pradesh (n=120)
1	Human labour	17998.65 (25.13)	11178.43 (16.53)	11201.35 (22.85)
2	Dfls*	6743.80 (9.41)	5918.32 (8.75)	4998.65 (10.20)
3	Material**	4543.50 (6.34)	4105.25 (6.07)	2486.21 (5.07)
4	Marketing	2166.65 (3.03)	1855.75 (2.51)	1799.98 (3.18)
5	Interest on working capital (@ 8 % per annum)	2516.17 (3.51)	1696.14 (2.51)	1558.88 (3.18)
6	Mulberry leaf	32360.06 (45.17)	35054.55 (51.83)	24752.00 (50.51)
7	Fixed cost***	5307.00 (7.41)	7830.00 (11.58)	2214.00 (4.52)
	Total	71635.83 (100.00)	67638.44 (100.00)	49011.07 (100.00)

Note: * includes chawki charges

** includes cost of lime powder, bleaching powder, sanitech, vijtha, uzi powder, news paper and other miscellaneous items

*** Cost on depreciation of rearing house and appliances and interest on fixed cost. The values in the brackets indicate percentage to total cost

In the case of Karnataka, farmers incurred an average cost of Rs. 71635.83 of which, 45.17 per cent was for mulberry leaf, 25.13 per cent for human labour, 9.41 per cent for dfls and 3.03 per cent for marketing. In Andhra Pradesh, the average cost of cocoon production was Rs. 49011.07. The cost toward mulberry leaf accounted for Rs.24752.00) which is 50.51 per cent of the total cost followed by labour (Rs. 11201.35), dfls (Rs. 4998.65), material (Rs. 2486.21) and marketing (Rs. 1799.98). The fixed cost on rearing house and appliances for Karnataka and Andhra Pradesh were estimated at Rs. 5307 and Rs. 2214 respectively. It is further observed that the cost of cocoon production varied distinctly across the states. The highest cost of cocoon production was reported in Karnataka than that of Tamil Nadu and Andhra Pradesh. This is chiefly on account of the higher labour wages prevailing in the study area of Karnataka.

Economics of Silk Cocoon Production

Table 3 portrays the economics of cocoon production across the three states. The annual gross returns obtained per acre ranged from Rs.74607.85 in Andhra Pradesh to Rs.123059.06 in Karnataka. The same in Tamil Nadu was Rs.120703.92 per acre per annum. The net returns obtained were Rs. 53065.58, Rs. 51423.23 and Rs. 25596.78 for Tamil Nadu, Karnataka and Andhra Pradesh respectively. The highest net return was obtained in Tamil Nadu as a result of higher cocoon productivity. However, in the case of Andhra Pradesh, the cocoon productivity was lower due to semi-irrigated farming condition, which resulted in consumption of less quantity of Dfls per acre/year. The profitability as measured by the input-output ratios suggest that the profitability was the highest in Tamil Nadu (1:1.78) followed by Karnataka (1:1.72) and Andhra Pradesh (1:1.52).

The findings of the present study on economic analysis of silk cocoon production reveal that the profitability was much higher in Tamil Nadu vis-à-vis the other states because of higher adoption of newer technologies by the farmers in Tamil Nadu. In Andhra Pradesh although the profitability was less, the farmers still preferred sericulture on account of its comparative advantage over the other agriculture related enterprises in the drought prone region. Further, the easy access to labour force in the semi-irrigated region of Andhra Pradesh, encouraged farmers to continue sericulture throughout the year.

Table 3 : Economic Profile of Silk Cocoon Production

(Rupees/acre/year)

S.No.	Item	Karnataka (n=120)	Tamil Nadu (n=120)	Andhra Pradesh (n=120)
1	Cocoon yield (kg/acre/year)	928.760	926.258	550.236
2	Cocoon yield/100 dfls (kg)	62.004	65.121	55.023
3	Average cocoon price/ kg	129.27	126.57	128.87
4	Total return (includes by-product)	123059.06	120703.92	74607.85
5	Total cost of production	71635.83	67638.44	49011.07
6	Cost of cocoon	77.13	73.02	89.07
7	Net Returns	51423.23	53065.48	25596.78
8	Input-output ratio	1:1.72	1:1.78	1:1.52

Implications of the study

The empirical study clearly demonstrated that sericulture offers higher return in Tamil Nadu as compared to Karnataka and Andhra Pradesh due to adoption of recommended technologies including inbuilt facility for rearing house with adequate rearing appliances. This led to producing higher quantity of cocoons in Tamil Nadu over the other states in the study regions. Therefore, similar efforts should be emulated in Karnataka and Andhra Pradesh for boosting the productivity of cocoons and enhancing the profitability of the farmers. Hence, extension workers should advocate implementation of the recommended technologies for increasing the cocoon productivity. The sericulture development agencies of Southern states have to evolve suitable extension strategies and appropriate delivery mechanisms to popularize sericulture in the new areas considering the profitability in sericulture.

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Annexure-I**Details of Sample Composition of the Study Regions**

S.No.	Region	Name of state	Name of districts	No. of villages	Total sample size
1	Irrigated	Karnataka	Mandya	6	60
			Mysore	6	60
2	Irrigated	Tamil Nadu	Erode	6	60
			Coimbatore	6	60
3	Semi-irrigated	Andhra Pradesh	Anantapur	12	120
		Total	-	36	360