

Economic Analysis of Bivoltine and Cross-Breed Cocoon Production in Kolar District of Karnataka : A Micro-Level Evidence

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Abstract

Comparative economic analysis of bivoltine (CSR2 hybrids) and cross breed (PMXCSR2) cocoon production was done in Kolar district. The study revealed that the total variable cost for bivoltine and cross-breed was Rs 55,821.54 and Rs 48,726.15 which accounts for 87.12% and 86.31% respectively. Further, the net return from both the rearings were Rs 51,723.22 and Rs 33,510.73. To accrue these net returns, the total quantity of mulberry leaf used per acre per year for both was 23,653.53 kg and 20,780.45 kg respectively. The total cost of leaf production per acre per year was found to be Rs 32,540.64 and Rs 27,745.72. The total cost of cocoon production amounts to Rs 64,075.72 and Rs 56,453.10 with a per kg total cost of production of Rs 73.65 and Rs. 71.01, respectively. The cost incurred on the leaf and cocoon production for bivoltine was found to be higher than cross-breed. The results of the empirical analysis has shown that net profit earned from bivoltine cocoon production is much higher than cross breed rearings. However, the major concerns are frequent changes in cocoon prices which are uneconomical to quality cocoon producers. This emphasizes for suitable price policy measures to safe guard the bivoltine rearers with crop insurance, which could discourage the imports of silk from China in long run.

Key words : Bivoltine, Cocoon price, Cost benefit ratio, Cross-breed, Policy measures.

Karnataka, a leading mulberry silk producing state in the country, has been practicing sericulture since Tippu Sultans period. It offers regular income and own family employment opportunities within own farm. In India, 98% of silk produced is of inferior quality. Attempts are being made to increase quality cocoon production with Japanese international co-operation agency (JICA) in recent years. The recent technological break through both in Mulberry variety (VI) and package of practices have made sericulture more sustainable and cost saving. Although, several studies (1—4) were attempted to analyze economic gain from mulberry sericulture. Studies such as comparative economic analysis of new bivoltine (CSR races) versus cross breed are meager. Hence, a study was conducted in Kolar district of Karnataka to assess the economics of bivoltine versus cross-breed cocoon production in the field with clientele.

Methods

The study was conducted in two taluks of Kolar district namely, Chintamani and Kolar. Three villages from each of these taluks were selected. From each selected village, 15 farmers were randomly selected.

The farmers were categorized in to two groups based on the number of CSR hybrids and cross-breed rearing undertaken during the study period. Thus, the study constituted 90 farmers from six villages as samples. The data were collected by direct interview method by administering a pre-tested schedule. For making costs and returns comparisons between CSR hybrids and cross-breed cocoon rearing were made. The costs and returns for each group were separately worked out per acre as unit during the reference period (2006-07).

Results and Discussion

Cost of cultivation of mulberry is primarily governed by the fixed and variable costs. The share of fixed cost of mulberry garden establishment is worked out considering the quantity of inputs applied for raising mulberry for 6 months. Table 1 shows the costs of different inputs used for establishing mulberry garden for bivoltine and multivoltine rearers separately. For bivoltine rearing, the total cost incurred was estimated to be Rs 59,700.50 per acre and for multivoltine, it was Rs 44,750.63. The different resources employed by bivoltine farmers, the highest

Table 1. Cost of Establishment of mulberry garden (per acre).
* Includes apportioned fixed cost on bore well and pump set with labor.

Variable	Bivoltine		Cross-breed	
	Rs	Percent	Rs	Percent
1 Human labour	2311.80	3.87	2203.20	4.92
2 Animal labour/Tractor	1846.00	3.04	1650.00	3.69
3 Farm yard manure	4000.00	6.70	3000.00	6.70
4 Chemical fertilizer	1450.00	2.43	1250.00	2.79
5 Irrigation*	43465.38	72.80	31579.19	70.57
6 Planting material	1200.00	2.02	1000.00	2.23
7 Interest	5427.32	9.09	4068.24	9.10
Total cost	59700.50	100.00	44750.63	100.00

cost was incurred on irrigation (Rs 43,465.38) followed by interest (Rs 5,427.32), farmyard manure (Rs 4,000.00), human labor (Rs 2,311.80), bullock or tractor power (Rs 1846.00), Chemical fertilizer Rs 1,450.00, while planting material was Rs 1,200.00. For multivoltine cocoon producing farmers, the highest share of total cost was incurred for irrigation (Rs 31,579.19) while interest was Rs 4,068.24, farm yard manure Rs 3,000.00, human labor Rs 2,203.20, animal or tractor power Rs 1,650.00 chemical fertilizer Rs 1,250.00 and planting material Rs 1,000.00 were placed in the descending order.

Cost of Cultivation of Mulberry Leaf Production

The mulberry leaf production activity continues

round the year. Therefore, inputs are to be applied to the garden periodically. The details of cost incurred on mulberry leaf production by bivoltine and cross-breed cocoon producers are presented in Table 2. An amount of Rs 32,540.64 for bivoltine and Rs 27,575.72 for cross-breed farmers were incurred for producing mulberry leaf from one acre garden per year.

Of the total cost of mulberry leaf production by bivoltine farmers cost of human labor shared to the extent of 27.52%. Whereas, the share of other costs were 14.18% for irrigation, 13.42% for farm yard manure, 12.51% for bullock or tractor power, 12.16% for chemical fertilizer, while 7.98% for interest and 12.23% for mulberry garden establishment. For cross breed rearers, the cost of human labor was estimated at Rs 8,166.99. The cost incurred for other inputs such as farm yard manure, bullock or tractor power, irrigation, chemical fertilizer and interest on the working capital, the shares of garden establishment were Rs 3,977.92, 3,660.45, 3,656.11, 2,895.20 and 2,235.67, respectively. In terms of per cent of various input costs the human labor accounted for 29.61 followed by farm yard manure use (14.43), bullock or tractor power (13.27), irrigation (13.26), chemical fertilizers (10.50), interest on working capital (8.11) and share of establishment of garden (10.82).

Cost and Returns from Sericulture

The cost of cocoon production from one acre per year is shown in Table 3. The total cost of cocoon production is made up of two parts namely, fixed cost accounting for depreciation on rearing house and

Table 2. Cost of mulberry leaf production (per acre per year) including Irrigation.

Variable/ Input	Bivoltine		Cross-breed	
	Rs	Percent	Rs	Percent
(a) Variable Cost				
Variable cost				
1 Human labor	8955.75	27.52	8166.99	29.61
2 Animal labor	4071.25	12.51	3660.45	13.27
3 Farm yard manure	4367.18	13.42	3977.92	14.43
4 Chemical fertilizer	3956.50	12.16	2895.20	10.50
5 Irrigation	4613.51	14.18	3656.11	13.26
6 Interest	2596.42	7.98	2235.67	8.11
(a) Total variable cost	28560.61	87.77	24592.34	89.18
(b) Fixed Cost				
(share of establishment of garden)	3980.03	12.23	2983.38	10.82
Total cost (a + b)	32540.64	100.00	27575.72	100.00

Table 3. Cost and return from Sericulture (per acre/year) 2006—07. Other Items include cost of disinfections and mountages.

Variable	Bivoltine		Cross-breed	
	Rs	Per cent	Rs	Percent
I Fixed Cost				
1 Depreciation on rearing house and equipment	7369.67	11.50	6827.63	12.09
2 Interest on fixed capital and land rent	884.36	1.38	899.32	1.59
Total fixed cost	8254.03	12.88	7726.95	13.69
II Variable Cost				
1 Human labor	9898.53	15.46	8954.32	15.86
2 DFL's	4448.50	6.94	3861.00	6.84
3 Material (disinfectants and mountages)	5460.89	8.52	4940.53	8.75
4 Marketing	978.60	1.53	1060.00	1.88
5 Interest on working capital	2494.38	3.89	2334.58	4.14
6 Mulberry leaf	32540.64	50.78	27575.72	48.85
Total variable cost (II)	55821.54	87.12	48726.15	86.31
Total cost (I + II)	64075.57	100.00	56453.10	100.00
III Returns				
1 Main product	113298.79		87463.83	
2 By product	2500.00		2500.00	
3 Gross return	115798.79		89963.83	
4 Total Cost	64075.57		56453.10	
5 Net return	51723.22		33510.73	

equipments and interest on fixed capital; variable costs which includes costs of human labor for silkworm rearing, DFL's materials used for disinfection and mountages, marketing, mulberry leaf and interest on working capital. The share of fixed and variable cost in total cost for bivoltine farmers were worked out to 12.88 and 87.12% respectively. For cross breed farmers, the corresponding per cent shares were 13.69 and 86.31. Of the total variable costs of bivoltine farmers, cost of mulberry leaf alone was accounted for 50.78% Rs 32,540.64. Next to mulberry leaf, human labor, disinfectants and mountages, DFL's, interest on working capital and marketing accounted for 15.46%. Rs 9,898.53, 8.52% Rs 5,460.89, 6.94% Rs 4,448.50, 3.89% Rs 2,494.38 and 1.53% Rs 978.60 of the total cost of cocoon production, respectively.

It was estimated that farmers who reared bivoltine cocoons have earned Rs 115,798.79 as gross profit while cross-breed cocoon producers earned Rs 89,963.83. The net profit was estimated to be Rs 51,723.22 and 33,510.73 for bivoltine and cross breed cocoon. Thus the results indicate that the bivoltine rearers have earned higher profit than the cross-breed rearers.

The mulberry leaf yields obtained from one acre of garden for bivoltine and cross-breed rearers were worked out to 23,653.53 kg and 20,780.45 kg respec-

tively. The cost per kg of leaf was estimated to be Rs 1.38 for bivoltine rearers and Rs 1.32 for cross-breed cocoon producers (Table 4).

The average number of DFL's brushed per acre per year was 1,271 for bivoltines and 1,320 for cross breed cocoon producers. Cocoon yield for 100 DFL's, it was 68.45 kg for bivoltine and 57.20 kg for cross-breed races. Further, the cost of production for one kg of bivoltine cocoon was to the tune of Rs 73.65 whereas it was Rs 71.01 for cross-breed cocoon. The cost-benefit ratios for producing one kg of bivoltine and cross-breed cocoon were 1 : 1.77 and 1 : 1.59, respectively.

Policy Implications

This study indicated that the return from bivoltine cocoon production was higher as compared to cross-breed cocoon production. The important reason for reaping higher profit in bivoltine rearing are higher cocoon productivity and higher cocoon price than that of cross-breed cocoon production. The CSR hybrid races are picking up fast in the study areas as farmers are showing more interest in taking up such races. One of the important focuses of Indian sericulture is to strengthen bivoltine silk production domestically and discourage import of Chinese silk. At this

Table 4. Summary of major findings.

Particulars	Bivoltine	Cross-breed
1 Average area brider mulberry (acre)	1.27	1.38
2 Leaf yield (kg/acre/year)	23653.53	20780.45
3 Cost of leaf (Rs/acre/year)	32,540.64	27,575.72
4 Cost of leaf (Rs/ kg)	1.38	1.32
5 Average number of DFL's	1,271	1,320
6 Cocoon yield (kg/acre/year)	869.99	795.05
7 Cocoon production cost (Rs/acre/year)	64,075.57	56,453.10
8 Cocoon yield per 100 DFL's (kg)	68.45	57.20
9 Cost of cocoon production (Rs/kg)	73.65	71.01
10 Gross return (Rs/acre/year)	115,798.79	89,963.83
11 Average cocoon price (Rs/kg)	130.23	110.00
12 Cost-benefit ratio	1 : 1.77	1: 1.59

stage, the prevailing CSR hybrid races should be popularized on large scale to increase quality silk production in the country. However, many farmers reported during the field survey revealed that the rearing of bivoltine is risky and required more capital than that

of cross-breed cocoon production more so, the cocoon price of bivoltine is unstable and many a time its price is lower than that of cross-breed races in the market. Therefore, the government has to come up with sound cocoon price policies to protect bivoltine farmers and a comprehensive insurance policy program should be implemented to encourage farmers to pursue quality cocoon production in the study villages.

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