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Costs and returns of sericulture in traditional and non-traditional areas of Karnataka

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Abstract

The analysis reveals notable differences in the costs and returns for both mulberry cultivation and silkworm rearing between traditional and non-traditional regions. In non-traditional regions, total cultivation costs are higher due to increased expenses on labour, irrigation, and fixed costs such as land rental. In mulberry cultivation, traditional regions show better profitability, with higher yields of 4,825 kilograms and net returns of ₹6,727.29, compared to 4,650 kilograms and ₹ 1,298.60 in non-traditional regions. The return on investment is also higher in traditional regions, with ₹ 1.25 per rupee spent, versus ₹ 1.04 in non-traditional areas. Similarly, silkworm rearing in traditional regions is more cost-effective, with total costs of ₹ 70,778.81 compared to ₹75,152.14 in non-traditional regions. Cocoon yields are higher in traditional areas, at 185 kilograms, leading to gross returns of ₹ 107,275, compared to 174 kilograms and ₹ 101,210 in non-traditional regions. Net returns and returns per rupee of expenditure are better in traditional regions, standing at ₹ 36,496.19 and ₹ 1.52, respectively. Overall, traditional regions benefit from better resource efficiency, favourable conditions and established practices, while non-traditional regions require improvements in cost management and yield efficiency to enhance profitability.

Keywords: Mulberry cultivation, cocoon production, cost and returns

Introduction

Sericulture is an agro-based rural industry that involves the rearing of silkworms for the production of cocoons, which are then used to produce raw silk. This raw silk is obtained from the cocoons spun by mulberry silkworms. Sericulture plays a vital role in the socio-economic development of rural areas. It is a highly labour-intensive, profitable, and low-input indoor activities that provides frequent and periodic economic returns. Moreover, it is particularly well-suited for women in rural sectors, offering them opportunities for income generation. Mulberry sericulture serves as a reliable source of income for rural communities, requiring minimal capital investment while providing year-round employment opportunities. Cocoon production involves two key economic activities: mulberry cultivation and silkworm rearing. The establishment phase takes approximately six months, with the mulberry garden requiring continuous maintenance throughout the year. The process of rearing silkworms for cocoon production spans 30 to 40 days per cycle. Several studies have been conducted to assess the economic viability of sericulture in regions such as Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal, and Jammu & Kashmir (Munikrishnappa *et al.* (2009) ^[6], Kumaresan *et al.* (2010)). The current study aims to explore the economic profile of sericulture, as well as examine its associated costs and returns.

Methodology

The study was conducted in traditional sericultural districts namely Ramanagara and Chikballapur of Karnataka where most of the farmers practice sericulture and in the non-traditional districts namely Ballari and Raichur of Karnataka. A multistage random sampling technique was used to collect the required information from the 120 sericulture growers. A pre-tested well-structured questionnaire was prepared considering different parameters relating to sericultural activities such as participation in various activities of mulberry cultivation and

silkworm rearing. Simple statistical classification is done to count the percentage of female participation in sericultural practices.

Results and Discussion

The data presented in tables 1 and 2 analyse the costs and returns of mulberry cultivation and cocoon production in both traditional and non-traditional regions, focusing on various agricultural activities. The study divides these activities into two main categories: mulberry cultivation and cocoon production.

The costs associated with mulberry sericulture are further classified into variable and fixed costs. Variable costs include expenses that fluctuate with each production cycle, such as labour, fertilizers, pesticides, silkworm eggs and rearing materials. Fixed costs, on the other hand, consist of long-term investments like the establishment of mulberry gardens, construction of rearing houses and acquisition of equipment. These fixed costs remain constant over time. Analysing both types of costs is crucial for assessing the profitability of sericulture.

Table 1: Cost and returns of Mulberry Cultivation (Quantity/rearing/acre)

Sl. No.	Particulars	Unit	Traditional region		Non-traditional region	
			Qty.	Value (₹)	Qty.	Value (₹)
A.	Variable cost					
1	Humanlabour	MD	25	6400	30	7020
2	Bullockpair	MD	3	1500	3	1650
3	FYM	Tractor load	1	2850	1	2900
4	Fertilizers	kg	70	2125	75	2200
5	Irrigation		-	1895	-	2985
6	Miscellaneous	₹	-	145	-	210
7	Interestonworkingcapital@ 7.5%	₹	-	1118.62	-	1272.38
Sub-total(A)				16,033.62		18,237.38
B.	Fixed cost					
1	Landrevenue	₹	-	65	-	80
2	Depreciation	₹	-	240	-	250
3	RentalvalueofLand	₹	-	2500	-	3000
4	Amortized establishmentcost	₹	-	7726.59	-	8359.02
Sub-total(B)				10531.59		11689.02
Totalcost(A+B)				26565.21		29,926.40
C.	Returns					
1	Mulberry shoot	kg	4825	33292.50	4650	31225.00
Gross returns				33292.50		31225.00
Net returns				6727.29		1298.60
Returns per rupee of expenditure				1.25		1.04

Note: MD- Mandays, FYM= Farm Yard Manure

Table 1 provides a detailed analysis of the costs and returns associated with mulberry cultivation in both traditional and non-traditional regions, highlighting the economic disparities between these areas. In traditional regions, the total variable cost for mulberry cultivation is ₹ 16,033.62. In non-traditional regions, total cultivation costs are significantly higher, reaching ₹29,926.40, compared to ₹ 26,565.21 in traditional regions. This increase is largely due to elevated variable costs, particularly for labour, irrigation and fertilizers. Additionally, fixed costs, such as land rental values and amortized establishment expenses, are also greater in non-traditional areas, contributing to the overall higher cost structure. In conclusion, the data clearly demonstrate that traditional regions have a marked economic advantage over non-traditional regions in mulberry cultivation. Kumaresan *et al.* (2010) was found similar findings in their study. Munikrishnappa *et al.* (2009) [6] in their study on economics of sericulture in drought prone region of Andhra Pradesh obtained total cost of mulberry leaf production of ₹24,752.

In terms of yield and profitability, traditional regions outperform non-traditional ones. Mulberry shoot production is higher in traditional regions, with 4,825 kilograms harvested compared to 4,650 kilograms in non-traditional regions. In the traditional region, the gross return was ₹ 33,292.50 and the net return was ₹6,727.29, with a return of 1.25 per rupee of expenditure. Whereas, in the non-traditional region, the gross returns was ₹31,225.00 and the net returns was ₹1,298.60, with a return of 1.04 per rupee of expenditure. This significant difference in economic returns was attributed to both the higher production

volume and the elevated market price for mulberry leaves in traditional region. These results are in conformity with those of Meenal and Rajan (2011) [5].

The results highlight the economic advantages of mulberry cultivation in traditional regions over non-traditional regions. The lower total costs in traditional regions can be attributed to greater familiarity with cultivation practices, more efficient use of inputs and possibly better soil and climatic conditions. The higher costs in non-traditional areas, especially for labour and irrigation, may reflect the need for additional inputs due to less favourable growing conditions or less experienced labour. Additionally, higher land rental values and establishment costs in non-traditional regions increase fixed expenses, further reducing profitability. Despite similar inputs in terms of fertilizers and farmyard manure, the slightly lower yield in non-traditional regions suggests that agronomic conditions play a significant role in determining output. Overall, the higher net returns and return on investment in traditional regions indicate that mulberry cultivation is more economically sustainable in these areas, suggesting that efforts to improve efficiency and reduce costs in non-traditional regions are necessary to enhance profitability.

Table 2 shows cost and returns of silkworm cocoon production from both traditional and non-traditional region. The analysis shows that the total costs of silkworm rearing are higher in non-traditional regions compared to traditional regions. In non-traditional regions, total costs amount to ₹75,152.14, while in traditional regions, they are lower at ₹70,778.81. This difference

is primarily due to higher transportation and marketing costs in non-traditional regions, with transportation of chawki worms costing ₹ 2,400 compared to ₹ 400 in traditional regions. Human labour costs are also higher in non-traditional areas, with ₹ 8,350 spent on 35 mandays, compared to ₹ 7,950 for 32 mandays in traditional regions. Although the quantity of certain disinfectants and materials is similar, slight cost differences can be seen and interest on working capital is marginally higher in non-traditional regions. Overall, the variable costs are ₹ 60,366.63 in non-traditional regions, slightly more than the ₹ 58,364.44 in traditional areas.

In terms of yield, traditional regions again show better performance. Cocoon yield is higher in traditional regions at 185 kilograms, leading to gross returns of ₹1,06,375, while in non-traditional regions, the yield is 174 kilograms, with gross returns of ₹1,00,050. Jelly cocoon yield is slightly higher in non-traditional regions, but this difference does not compensate for the lower overall cocoon production. Net returns are

significantly better in traditional regions, where they amount to ₹ 36,496.19, compared to ₹26,057.86 in non-traditional regions. The returns per rupee of expenditure also favour traditional regions, standing at 1.52, compared to 1.35 in non-traditional regions.

The results indicate that silkworm rearing is more cost-effective and profitable in traditional regions. Despite marginally higher input costs for labour and materials, the better yield and gross returns in traditional regions make the investment more efficient. Non-traditional regions face higher transportation and marketing costs, which reduce profitability despite similar production practices. The higher net returns and returns per rupee of expenditure in traditional regions suggest that experience, established practices, and favourable environmental conditions contribute to superior performance. To improve profitability in non-traditional regions, efforts to reduce transportation and marketing costs or enhance yield efficiency are necessary.

Table 2: Cost and Returns of silk worm cocoon production (₹ per 200DFLs)

Sl. No.	Particulars	Unit	Traditional region		Non-traditional region	
			Qty.	Value (₹)	Qty.	Value (₹)
A.	Variable cost					
1	DFLs	No.	200	9000	200	9000
2	Transportation Cost of chawki worms	₹	-	400	-	2400
3	Humanlabour	MD	32	7950	35	8350
4	Disinfectants					
a.	Vijetha	Kg	9	900	9.6	950
b.	Ankusha	Kg	10	500	10.5	520
c.	Limedust	Kg	70	700	75	710
d.	Bleaching powder	Kg	9	450	10	500
5	Paraffinpaper	Kg	3	700	3	750
6	Newspaper	Kg	20	200	20	250
7	Mulberry shoot feeding	Kg	4825	33292.50	4650	30225
8	Marketingcost	₹	-	200	-	2500
9	Interestonworking capital@7.5%	₹	-	4071.94	-	4211.63
Sub-total(A)				58364.44		60366.63
B.	Fixed cost					
1	Amortized establishment cost	₹		12414.37		14785.51
Totalcost(A+B)				70778.81		75152.14
C	Yield					
1	Cocoon yield	Kg	185	106375	174	100050
2	Jelly cocoon	Kg	6.00	900	8.00	1160
Gross returns		₹		107275		101210
Net returns		₹		36496.19		26057.86
Returns per rupee of investment				1.52		1.35

Note: DFLs= Disease free layings, MD= Mandays

Conclusion

In traditional regions, the total variable cost for mulberry cultivation is ₹ 16,033.62. In non-traditional regions, total cultivation costs are significantly higher, reaching ₹ 29,926.40, compared to ₹ 26,565.22 in traditional regions. In the traditional region, the gross return was ₹ 33,292.50 and the net return was ₹ 36,727.29, with a return of 1.25 per rupee of expenditure. Whereas, in the non-traditional region, the gross returns was ₹ 31,225.00 and the net returns was ₹ 1,298.60, with a return of 1.04 per rupee of expenditure. The variable cost of silk cocoon production was ₹ 58,364.44 in traditional regions, while it was higher in non-traditional regions at ₹ 60,366.63. The largest portion of the total variable cost was spent on mulberry shoot feeding, with human labour and marketing costs also being significant contributors to the overall expenses. In the traditional region, the whole cost of production including fixed and variable costs, comes to ₹ 70,778.81. In contrast, the total expenses in the

non-traditional region come to ₹ 75,152.14. And gross returns in traditional region was ₹ 1,07,275 whereas, ₹ 1,01,210 in non-traditional regions. The net returns achieved were highest in the traditional region, totalling ₹ 36,496.19 per 200 disease free layings (dfl's), compared to ₹ 26,057.86 per 200 dfl's in the non-traditional region.

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