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Economic Evaluation of Chawki Rearing Centres in Kanakapura Taluk of Karnataka

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Abstract

The Chawki Rearing Centres (CRCs) occupy a special place in the commercial setting of the sericulture industry of Karnataka. They play a huge role in the success of any silkworm crop and in maximizing the farmer's income. The Kanakapura Taluk in Ramanagara district of Karnataka is a hotspot of CRCs. Thus, the present study investigated about the economic affairs of commercially running CRCs and their financial feasibility in Kanakapura Taluk by conducting interview sessions with the CRC owners. Three categories were made based on chawki mulberry acreage: Type I (2-3 acres), Type II (4-5 acres) and Type III (6-7 acres) and economic analysis was done. The total cost of production in Type I, Type II and Type III CRCs were Rs. 39,38,487, Rs. 60,44,685 and Rs. 85,84,216 respectively and gross returns were Rs. 67,60,000, Rs. 1,08,90,000 and Rs. 1,64,43,000 respectively. Net return per 100 DFLs was highest in Type III CRCs at Rs. 2504 and lowest in Type I CRCs at Rs. 2015. Financial feasibility was assessed by using Benefit Cost Ratio (BCR) and it was greater than one in all types of CRCs indicating the profitable nature of CRCs. BC ratio of 1.92 in Type III CRCs and 1.72 in Type I CRCs indicated that CRCs with more mulberry acreage were more profitable than the lesser ones.

Keywords: Chawki rearing centres, total cost of production, gross return, benefit cost ratio, feasibility

1. Introduction

Sericulture is a craft and science of rearing silkworms to produce silk. It includes cultivation of mulberry, rearing of silkworms, reeling of silk thread from cocoons, weaving the silk yarn and further processing to produce the silk fabric (Kumar *et al.*, 2019) ^[1]. Silkworm rearing is an important aspect of sericulture. The silkworm larvae grow during rearing by undergoing five instars along with four moults in between the instars. The rearing period starts from the hatching of the silkworm eggs and ceases at spinning of matured worms covering a total span of 23-24 days. Considering the physiology of the silkworms and effect of ecological factors at different growth stages, the silkworm rearing is conducted separately as young age and late age rearing. Distinctively, the rearing of young age silkworms up to the second moult is known as chawki rearing. The success of silkworm crop depends greatly on the performance of chawki rearing.

The concept of chawki rearing is based on the Japanese Kego rearing which has numerous advantages over traditional silkworm rearing. The prominent advantages are proper egg incubation & uniform hatching, robust and disease free chawki worms, prevention of crop loss and cocoon crop stabilization, reduction in production cost of cocoons and increased yield of good quality cocoons (20-25% higher) leading to higher profits of the farmers (Sivaprasad *et al.*, 2015) ^[10]. The rearing of chawki worms is carried out in some specialized centres called Commercial Chawki Rearing Centres (CRCs) bearing high tech

infrastructure and facilities with controlled environmental conditions extensively supervised by skilled technicians. CRCs are more prevalent in the traditional sericulture states of southern India viz. Karnataka, Tamil Nadu and Andhra Pradesh catering to the exclusive development of sericulture by supplying the farmers with healthy and uniform chawki worms.

In the recent years, many private entrepreneurs have ventured into the field of sericulture and managed to create big CRCs based on the model developed by CSR&TI, Mysuru. Around 800 CRCs have been registered as per the Central Silk Board (Amendment) Act, 2006 throughout the country (Sivaprasad *et al.*, 2015) ^[10] and the number of centres is on the rise every year.

In Karnataka, around 460 CRCs are functioning properly providing lakhs of robust mulberry chawki disease free layings (DFLs) annually to the farmers (Dasari *et al.*, 2018) ^[5]. The adoption of chawki rearing technology by the farmers in the state has led to tremendous growth of sericulture and is currently leading the whole country in terms of raw silk production with 11,823 MT (Anonymous, 2023) ^[2]. The feasibility and profitability of running a CRC has attracted the new entrepreneurs. Several studies have been carried out to elucidate the economic growth of CRCs. According to Vijaya Kumari and Rajan (2005) ^[12], the concept of commercial chawki rearing can be a dynamic enterprise of resources as there was positive influence on variables of production, such as mulberry acreage, number of DFLs brushed per annum, the costs related to

disinfection, FYM application and chawki transportation on income derived from CRCs. Dasari *et al.*, 2018^[5] revealed in their studies on economics of CRCs in Tumakuru district, that investment in CRC is a financially appealing and successful idea. The CRCs of Kanakapura Taluk in Ramanagara district are also motivated by the profitability of this occupation and contributing a lot to the development of sericulture in the state. Hence, in our present study we have tried to analyse the economic factors pertaining to the performance of CRCs in the area and assess the total cost of production & total profit from the centres.

2. Materials and Methodology

The present study was conducted in Kanakapura Taluk in the Ramanagara district of Karnataka. The selection of the region was based on the number of CRCs, the area under mulberry cultivation, the engagement of sericulturists and the quantity of raw silk production.

In our study, 15 CRCs were selected randomly and personal interview sessions were conducted using a pre-set questionnaire with the CRC owners and data concerning the different set of variables for annual maintenance of a CRC were recorded. The CRCs were categorized into three types based on the availability of mulberry acreage-Type I (2-3 acres), Type II (4-5 acres) and Type III (6-7 acres). Factors like maintenance cost of mulberry garden, cost of chawki rearing house and rearing appliances & equipments, cost of disinfectants, labour cost and other miscellaneous costs were taken into account. The recorded data were organized properly and economic variables viz. recurring cost, non-recurring cost, total cost of production, gross return, net return and benefit cost ratio were calculated.

2.1 Recurring cost

Recurring costs refer to costs incurred on inputs, which are exhausted in one use in the production process. For example, cost of chemicals fertilizers, daily labour wage, cost of power tiller operations, DFLs, disinfectants, paraffin paper, transportation charges, other miscellaneous costs and interest on working capital etc. are recurring costs of CRCs.

2.2 Non-recurring cost

Non-recurring costs are incurred on resources which can be utilized in production process again and again as it does not get exhausted in one use. These are fixed in nature and occur one time only such as land revenue and taxes, rental value of owned land, management cost, risk factor and amortization cost etc. (Nath, 2008)^[9]. The annual amortization cost of borewell, drip irrigation system and rearing house & appliances in CRCs are calculated by the Straight-Line Method (Normal Amortization Method) formula given below (Dagistan and Kaya, 2022)^[4]:

$A = D/n$, where A= Annual amortization cost, D= Fixed asset value

n= Useful life of the asset (year)

2.3 Total cost of production

The sum of both the recurring cost and non-recurring cost in a production firm (CRCs) contribute to the total cost of production.

2.4 Gross return: The amount of revenue generated by selling of Chawki reared DFLs is the gross return.

2.5 Net return

The difference between gross return and the total cost of production in a CRC is calculated as the net return.

2.6 Benefit cost ratio (B: C ratio)

The ratio of gross return to the total cost of production is known as Benefit Cost Ratio. The BC ratio has to be more than 1 in order to confirm the economic feasibility of running a CRC (Kumar *et al.*, 2021)^[7].

3. Results and Discussion

The feasibility of running a CRC depends on the profitability from selling of chawki reared worms. While preparing chawki reared worms in the CRCs, a great deal of costs is incurred annually for the maintenance of mulberry chawki garden and conduction of chawki rearing operations. The size of the mulberry garden decides the level of production and cost associated with it. In our study, we classified the CRCs based on the mulberry acreage as Type I (2-3 acres), Type II (4-5 acres) and Type III (6-7 acres) respectively. The mulberry variety V1 was cultivated in all types of CRCs with different spacing: 2ft x (3ft +5ft) for Type I, 4ft x 3ft for Type II and 5ft x 3ft for Type III which optimized the leaf yield per acre. The leaf yield is an important prerequisite for determining the quantity of DFLs that can be brushed in a CRC. Generally, 20 kg of chawki leaf is required for 100 DFLs of chawki worms. Overall, 1.60 lakh DFLs can be reared @ 5000 DFLs/crop in 32 crop schedule per annum (3 crops/ month) from 1 ha of land annually (Sivaprasad *et al.*, 2015)^[10]. Despite this recommendation, the amount of DFLs or the number of batches varies among the CRCs, depending on factors such as availability of manpower and resources, demand of chawki worms and seasonal influence etc. (Kallimani *et al.*, 2021)^[6]. Based on our study, we found that average number of chawki DFLs (both crossbreed and bivoltine) reared by Type I, Type II and Type III CRCs were around 1.40 lakh DFLs, 2.22 lakh DFLs and 3.15 lakh DFLs respectively where crossbreed chawki production was around 4 times the bivoltine chawki production. The financial analysis of the three types of CRCs for maintenance of chawki rearing garden and regulation of chawki rearing operations was performed by taking into account the number of DFLs brushed and presented in Table 2, Table 4 and Table 6.

The maintenance of mulberry chawki garden was done by daily wage labours who perform activities like application of FYM & chemical fertilizers, irrigation, weeding, hoeing, pruning, leaf harvesting and power tiller operation for inter-row ploughing based on the number of leaf harvest throughout the year. However, inside chawki rearing house, the operations starting from the brushing of worms followed by bed spacing, bed cleaning, dusting of lime during moulting & bed disinfectants after moulting and management of environmental conditions untill the release of worms to the farmers at 2nd moult were handled by skilled and trained workers. Material inputs like FYM and chemical fertilizers (Urea, MOP, SSP etc.) were applied at times to maintain an established chawki garden using specific recommended practices (Thippeswamy *et al.*, 2013)^[11] while paraffin paper, lime and other disinfectants (Asthra, Bleaching Powder, Vijetha Forte) were needed for carrying out rearing operations in chawki rearing house. The

manpower and material costs vary with the level of production and are determined as recurring costs.

In Type I CRCs, the total recurring cost for managing the chawki rearing performance annually was estimated to be around Rs. 32,60,334 comprising of recurring cost for chawki garden calculated at Rs. 3,82,640, recurring cost for chawki rearing house @ Rs. 25,81,300 and interest on working capital considering 10% rate per annum evaluated at Rs. 2,96,394 (Table 2). In case of Type II CRCs, the recurring cost for chawki garden and chawki rearing house were valued at Rs. 5,63,600 and Rs. 40,12,860 respectively while the interest on working capital per annum was Rs. 4,57,646 making the total recurring cost valued at Rs. 50,34,106 (Table 4). While estimating the total recurring cost for Type III CRCs of Rs.71,18,643, the recurring cost for chawki garden and chawki rearing house were found out to be around Rs. 8,10,800 & Rs. 56,60,694 respectively and the interest on working capital per annum to be Rs. 6,47,149 (Table 6). The recurring cost for chawki garden, chawki rearing house and interest on working capital @10% per annum when expressed in percentage with regard to the total recurring cost were found out to be around 11%, 79% and 9% respectively in all types of CRCs. Moreover, the expenditure on DFLs was substantial bearing about 53-55%

of the total recurring cost which suggested about the expensiveness of raw material for chawki production.

Besides the recurring costs of maintaining a CRC, some costs are based on assets like rearing house, rearing appliances, borewell, drip irrigation system and owned land which are incurred during the establishment stage. They are referred to as non-recurring cost. Non-recurring costs included amortization cost of rearing house & appliances, borewell and drip irrigation system, land revenue and rental value of owned land etc. Moreover, management cost and risk factor were also considered under non-recurring cost. The different types of non-recurring costs for the CRCs are presented in Table 2, Table 4 and Table 6. The total amortization cost of rearing house and appliances were calculated out to be Rs. 60,332 (Table 1), Rs. 95,280 (Table 3) and Rs. 1,59,522 (Table 5) for Type I, Type II and Type III CRCs respectively. The computation and summation of each non-recurring cost factors led to the total non-recurring cost. The total non-recurring cost of the CRCs in the increasing order of garden size were Rs. 6,78,153, Rs. 10,10,579 and Rs. 14,35,573 respectively. The total recurrent cost and non-recurrent cost governs the total cost of production.

Table 1: Calculation of amortization cost (Type I CRCs)

Rearing building & equipments	Quantity required	Rate (Rs.)	Cost (Rs.)	Life span (years)	Amortization value (Rs.)
Rearing house for mulberry chawki worms (875 sq.ft.)	1	914/ sq. ft.	8,00,000	25	32,000
Plastic rearing tray (2 x3 sq.ft.)	300	530	1,59,000	15	10,600
Iron rearing tray (3 x 5 sq.ft.)	50	1200	60,000	15	4,000
Rearing stand (16 x 3.5 sq.ft.)	5	10,000	50,000	20	2,500
Incubation frames	70	70	4900	15	327
Leaf chopping machine	1	15,000	15,000	20	750
Feeding stands	2	1500	3,000	15	200
Room heater	2	7500	15,000	5	3,000
Humidifier	1	25,000	25,000	10	2,500
Power sprayer	1	15,000	15,000	10	1,500
Bed cleaning nets	350	65	22,750	10	2,275
Exhaust fan	2	1000	2,000	10	200
Chopsticks	15	30	450		
Plastic crates	4	700	2800	10	280
Wet & dry thermometer	2	1200	2400	15	160
Digital thermometer	2	300	600	15	40
Total Cost		80,065	11,71,100		60,332
Drip Irrigation System			1,43,100	15	9540
Borewell	1	2,50,000	2,50,000	20	12,500

The total cost of production per annum shows the accurate picture of the overall expenditure for maintaining a CRC. In Type I CRCs holding 2-3 acres chawki mulberry acreage, the total cost of production was Rs. 39,38,487. In Type II CRCs, the total cost of production was Rs. 60,44,685 with a considerable increase of 53.5% over Type I CRC. Furthermore, the total cost of production in Type III CRCs with 6-7 acres was Rs. 85,54,216 exceeding over the Type I and Type II CRCs by 117% and 42% respectively. The study also revealed that recurring cost shared about 83% while the non-recurring cost contributed only about 17% of the total cost of production. Hence, with the increase in level of production, the total recurring cost increased significantly which ultimately effected the total cost of production. However, the production cost of 100 DFLs chawki worms was highest in Type I CRCs (Rs. 2813) and

lowest in Type III CRCs (Rs. 2716) which highlighted that production cost per unit DFL decreased with the increase in production capacity. The production capacity of a CRC is directly related to the demand of the chawki worms by the farmers.

While surveying, it was found that the demand of chawki worms from the farmers varied among the CRCs. In large CRCs, the demand was high compared to the small CRCs as depicted by Mithilasri *et al.*, 2024^[8] and the supply of chawki worms was done accordingly. Besides this, the demand for crossbreed chawki was more than bivoltine chawki as in the findings of Basavaiah and Kallimani, 2020^[3]. The price setting of chawki worms was regulated based on farmers' demand & CRCs' supply and the gross returns were calculated. In Type I CRCs, the selling price of 100 DFLs crossbreed and bivoltine chawki worms were

Table 2: Economic analysis of type I CRCs with 2-3 acres mulberry acreage

A) Recurring Cost for Chawki Garden					E) Non-Recurring Cost		
Sl. No.	Particulars	Quantity	Unit	Value (Rs.)	Sl. No.	Particulars	Value (Rs.)
1.	Power Tiller Operation	20	machine hours	14,000	1.	Land Revenue and Taxes	250
2.	Farm Yard Manure	30	MT	51,000	2.	Amortized Drip Irrigation System Cost	9540
3.	Chemical Fertilizers	1400	kg	17,750	3.	Amortized Borewell Cost	12,500
4.	Application of FYM & Fertilizer	270	mandays	81,000	4.	Amortized Rearing House & Appliances Cost	60,332
5.	Irrigation	35	mandays	10,500	5.	Managerial Cost@10% of Working Capital	2,96,394
6.	Irrigation Charges			6,390	6.	Risk Factor @ 5% of Recurring Cost	1,63,017
7.	Weeding/ Hoeing	300	mandays	90,000	7.	Rental Value of Owned Land	1,36,120
8.	Leaf Harvest & Pruning	350	mandays	1,05,000			
9.	Miscellaneous			7,000			
	Sub Total			3,82,640 (11.7 % of D)		Total Non-Recurring Cost	6,78,153 (17.2%)
B) Recurring Cost for Chawki Rearing House					F) Abstract of Costs		
1.	Disease Free Layings (Cross Breed+Bivoltine)	1,10,000+30,000	DFLs	17,30,000	1.	Total Recurring Cost	32,60,334
2.	Disinfectants	464	kg	40,800	2.	Total Non-Recurring Cost	6,78,153
3.	Paraffin Paper	15	bundles	12,000	3.	Total Cost of Production	39,38,487
4.	Labour Charges	730	mandays	3,28,500	4.	Production Cost of 100 DFLs	2813
5.	Transportation Charges			4,50,000	5.	Gross Return@ 5000/100 DFLs (CB) and 4200/100 DFLs (BV)	67,60,000
6.	Others			20,000	6.	Net Return	28,21,513
	Sub Total			25,81,300 (79.2 % of D)	7.	Net Return/ 100 DFLs	2015
	C) Interest on working capital@10% per annum			2,96,394 (9.1% of D)	Benefit Cost Ratio		
	D) Total Recurring Cost			32,60,334 (82.8)	Gross Return/ Total Cost of Production		
					1.72		

Rs. 5000 and Rs. 4200 respectively which amounted to gross returns of Rs.67,60,000. Similarly, the total revenue generated in Type II CRCs was around Rs. 1,08,90,000 by selling of 100 DFLs crossbreed worms at Rs. 5000 and bivoltine chawki at Rs.4500. Also, considering the high demand in Type III CRCs, the selling price of 100 DFLs

crossbreed chawki was Rs. 5400 while that of bivoltine chawki was Rs. 4500 and the total gross income accumulated was Rs. 1,64,43,000. The actual benefit from the gross income is assessed using net return by subtracting the total cost of production.

Table 3: Calculation of amortization cost (Type II CRCs)

Rearing building & equipments	Quantity required	Rate (Rs.)	Cost (Rs.)	Life span (years)	Amortization value (Rs.)
Rearing house for mulberry chawki worms (1513 sq.ft.)	1	860/ sq. ft.	13,00,000	25	52,000
Plastic rearing tray (2 x3 sq.ft.)	350	500	1,75,000	15	11,667
Iron rearing tray (3 x 5 sq.ft.)	150	1200	1,80,000	15	12,000
Rearing stand (16 x 3.5 sq.ft.)	7	10,000	70,000	20	3,500
Incubation frames	100	70	7000	15	467
Leaf chopping machine	1 big 1 small	13,500 3,500	17,000	20	850
Feeding stands	3	1700	5100	15	340
Room heaters	2 big 2 small	7000 1500	17,000	5	3,400
Humidifier	1 big 2 small	35,000 7,500	50,000	10	5,000
Power sprayer	1	12,500	12,500	10	1,250
Electric sprayer	2	3,000	6,000	10	600
Bed cleaning nets	500	65	32,500	10	3,250
Exhaust fan	2	1200	2,400	10	240
Chopsticks	25	25	625		
Plastic crates	6	750	4500	10	450
Wet & dry thermometer	2	1500	3000	15	200
Digital thermometer	2	500	1000	15	67
Total Cost		1,01,870	18,23,625		95,280
Drip Irrigation System			1,93,464	15	12,898
Borewell	1	3,00,000	3,00,000	20	15,000

Table 4: Economic analysis of Type II CRCs with 4-5 acres mulberry acreage

A) Recurring Cost for Chawki Garden					E) Non-Recurring Cost		
Sl. No.	Particulars	Quantity	Unit	Value (Rs.)	Sl. No.	Particulars	Value (Rs.)
1.	Power Tiller Operation	36	machine hours	25,200	1.	Land Revenue and Taxes	450
2.	Farm Yard Manure	50	MT	90,000	2.	Amortized Drip Irrigation System Cost	12,898
3.	Chemical Fertilizers	1890	kg	29,100	3.	Amortized Borewell Cost	15,000
4.	Application of FYM & Fertilizer	384	mandays	1,15,200	4.	Amortized Rearing House & Appliances Cost	95,280
5.	Irrigation	50	mandays	15,000	5.	Managerial Cost@10% of Working Capital	4,57,646
6.	Irrigation Charges			11,500	6.	Risk Factor @ 5% of Recurring Cost	2,51,705
7.	Weeding/ Hoeing	432	mandays	1,29,600	7.	Rental Value of Owned Land	1,77,600
8.	Leaf Harvest & Pruning	460	mandays	1,38,000			
9.	Miscellaneous			10,000			
	Sub Total			5,63,600 (11.2% of D)		Total Non-Recurring Cost	10,10,579 (16.7%)
B) Recurring Cost for Chawki Rearing House					F) Abstract of Costs		
1.	Disease Free Layings (Cross Breed+Bivoltine)	1,80,000+ 42,000	DFLs	27,60,000	1.	Total Recurring Cost	50,34,106
2.	Disinfectants	613	kg	55,860	2.	Total Non-Recurring Cost	10,10,579
3.	Paraffin Paper	20	bundles	17,000	3.	Total Cost of Production	60,44,685
4.	Labour Charges	1095	mandays	4,38,000	4.	Production Cost of 100 DFLs	2723
5.	Transportation Charges			7,12,000	5.	Gross Return@ 5000/100 DFLs (CB) and 4500/100 DFLs (BV)	1,08,90,000
6.	Others			30,000	6.	Net Return	48,45,315
	Sub Total			40,12,860 (79.7% of D)	7.	Net Return/ 100 DFLs	2183
	C) Interest on working capital@10% per annum			4,57,646 (9.1% of D)		Benefit Cost Ratio	
	D) Total Recurring Cost			50,34,106 (83.3%)		Gross Return/ Total Cost of Production	1.80

Net returns for all types of CRCs were calculated and presented in Table 2, Table 4 and Table 6 respectively. Net returns were found out to be 72% (Type I), 80% (Type II) and 92% (Type III) over the total cost of production in the respective CRCs. Similarly, the net return of 100 DFLs chawki was highest in the Type III CRCs at Rs. 2504 and lowest in case of Type I CRCs at Rs. 2015. To estimate the profitability of CRCs used in the study, standard economic appraisal technique viz. Benefit Cost Ratio (BCR) was used. The BCR was highest in Type III CRCs (1.92) followed by

Type II CRCs (1.80) and the lowest in Type I CRCs (1.72). Therefore, the BCR of more than one made it clear that all the types of CRCs in our study area had been running profitably and the large CRCs with more mulberry garden size were slightly more profit-making than small CRCs with less mulberry acreage. Regardless of the size of the mulberry chawki garden, a CRC owner can make profit from a centre by brushing optimum number of DFLs. Hence, it can be concluded that chawki rearing centre is an economically viable enterprise.

Table 5: Calculation of amortization cost (Type III CRCs)

Rearing building & equipments	Quantity required	Rate (Rs.)	Cost (Rs.)	Life span (years)	Amortization value (Rs.)
Rearing house for mulberry chawki worms (2400 sq.ft.)	1	921/ sq. ft.	22,10,000	25	88,400
Plastic rearing tray (2 x3 sq.ft.)	400	580	2,32,000	15	15,467
Iron rearing tray (3 x 5 sq.ft.)	300	1200	3,60,000	15	24,000
Rearing stand (16 x 3.5 sq.ft.)	10	10,000	1,00,000	20	5,000
Incubation frames	150	75	11,250	15	750
Leaf chopping machine	2	25,000	50,000	20	2,500
Feeding stands	5	1800	9,000	15	600
Room heaters	3 Big 3 small	7500 2500	30,000	5	6,000
Humidifier	2	40,000	80,000	10	8,000
Power sprayer	1	15,250	15,250	10	1525
Electric sprayer	2	2500	5000	10	500
Bed cleaning nets	700	70	49,000	10	4900
Exhaust fan	2	5000	10,000	10	1000
Chopsticks	20	30	600		
Plastic crates	8	700	5600	10	560
Wet & dry thermometer	4	900	3600	15	240
Digital thermometer	4	300	1200	15	80
Total cost		1,26,326	31,84,500		1,59,522
Drip irrigation system			2,79,448	15	18,630
Borewell	2	2,50,000	5,00,000	20	25,000

Table 6: Economic analysis of Type III CRCs with 6-7 acres mulberry acreage

A) Recurring Cost for Chawki Garden					E) Non-Recurring Cost		
Sl. No.	Particulars	Quantity	Unit	Value (Rs.)	Sl. No.	Particulars	Value (Rs.)
1.	Power Tiller Operation	54	machine hours	37,800	1.	Land Revenue and Taxes	650
2.	Farm Yard Manure	80	MT	1,40,800	2.	Amortized Drip Irrigation System Cost	18,630
3.	Chemical Fertilizers	2730	kg	40,980	3.	Amortized Borewell Cost	25,000
4.	Application of FYM & Fertilizer	570	mandays	1,71,000	4.	Amortized Rearing House & Appliances Cost	1,59,522
5.	Irrigation	75	mandays	22,500	5.	Managerial Cost@10% of Working Capital	6,47,149
6.	Irrigation Charges			16,600	6.	Risk Factor @ 5% of Recurring Cost	3,55,932
7.	Weeding/ Hoeing	620	mandays	1,73,600	7.	Rental Value of Owned Land	2,28,690
8.	Leaf Harvest & Pruning	684	mandays	1,91,520			
9.	Miscellaneous			16,000			
	Sub Total			8,10,800 (11.4% of D)		Total Non-Recurring Cost	14,35,573 (16.8%)
B) Recurring Cost for Chawki Rearing House					F) Abstract of Costs		
1.	Disease Free Layings (Cross Breed+Bivoltine)	2,52,000 + 63,000	DFLs	39,06,000	1.	Total Recurring Cost	71,18,643
2.	Disinfectants	945	kg	80,194	2.	Total Non-Recurring Cost	14,35,573
3.	Paraffin Paper	30	bundles	25,500	3.	Total Cost of Production	85,54,216
4.	Labour Charges	1460	mandays	6,57,000	4.	Production Cost of 100 DFLs	2716
5.	Transportation Charges			9,50,000	5.	Gross Return@ 5400/100 DFLs (CB) and 4500/100 DFLs (BV)	1,64,43,000
6.	Others			42,000	6.	Net Return	78,88,784
	Sub Total			56,60,694 (79.5% of D)	7.	Net Return/ 100 DFLs	2504
	C) Interest on working capital@10% per annum			6,47,149 (9.1% of D)	Benefit Cost Ratio		
	D) Total Recurring Cost			71,18,643 (83.2%)	Gross Return/ Total Cost of Production		
							1.92

4. Conclusion

In the recent scenario, chawki rearing centres plays a major role in the sericultural economy of the state. Kanakapura is seen as a hotspot of numerous successful CRCs. Many new entrepreneurs have invested in this enterprise while others are interested in joining this endeavour. The economic analysis of different types of CRCs will help the entrepreneurs to properly allocate funding resources towards the overall maintenance of CRCs. The success of chawki rearing enterprise depends on the effective utilization of mulberry acreage, rearing house, constant demand of the farmers, consistency and regularity in production, quality control, adoption of scientific package of practices and proper management of manpower etc. This study revealed that the larger CRCs are more profitable than smaller CRCs. However, smaller CRCs also offer lucrative profits as suggested by the benefit-cost ratio.

References

- Anil Kumar GN, Reddy BS, Goudappa SB, Hiremath GM, Patil SS. Growth performance of silkworm cocoon production in Karnataka, India. *Int J Curr Microbiol Appl Sci.* 2019;8(11):674-682.
- Anonymous. Annual report 2022-23, English section. Central Silk Board; c2023. p. 81.
- Basavaiah, Kallimani CS. Constraints faced in the adoption of technologies by Chawki rearing centre entrepreneurs. *J Ext Educ.* 2020;32(2):6520-6530.
- Dagistan E, Kaya A. Methods of calculation amortization in agriculture. In: Bahsi N, Budak B, editors. *Agriculture research in nowadays.* Lyon, France: Livre de Lyon; c2022. p. 75-84.
- Dasari JR, Jayaram H, Somaprakash DS, Sivaprasad V. Economic analysis of commercial Chawki silkworm production in Tumakuru District of Karnataka. *Int J Trop Agric.* 2018;36(2):275-282.
- Kallimani CS, Basavaiah, Divya SH. Economic performance and factors discriminating entrepreneurship of commercial Chawki rearing centres of Karnataka. *Agric Res J.* 2021;58(2):312-317.
- Kumar B, Sushila, Limje S. Cost benefit analysis of tomato nursery raising. *J Pharmacogn Phytochem.* 2021;10(2):123-126.
- Mithilasri M, Shankar SM, Uma K. An economic study of Chawki rearing centres in Tamil Nadu. *Int J Chem Stud.* 2024;12(2):16-19.
- Nath SK. Manual on cost of cultivation surveys. New Delhi: Indian Agricultural Statistical Research Institute; c2008. p. 14-24.
- Sivaprasad V, Himantharaj MT, Verma S, Mogili T. Commercial Chawki rearing. Mysuru, Karnataka: Central Sericultural Research & Training Institute; c2015. p. 1-46.
- Thippeswamy, Dasappa, Bindroo BB. Maintenance and management of Chawki mulberry garden. In: Bindroo B, editor. *Commercial Chawki rearing-exploring new horizons.* Mysuru, Karnataka: Central Sericultural Research & Training Institute; c2013. p. 1-3.
- Vijaya Kumari KM, Rajan RK. An economic analysis of factors influencing income from commercial Chawki rearing centre owners in Karnataka. *Indian J Seric.* 2005;44(2):208-211.