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An economic analysis of sericulture farming in rain fed areas of Jammu region: A comparative study

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Abstract

The present study evaluated the economics of sericulture farming in Kathua, Rajouri and Udhampur districts of Jammu region as these were having the maximum number of silkworm rearers and cocoon production. The primary data were collected from 270 silkworm rearers selected randomly in the year 2017-18. The results indicated that for the establishment of mulberry garden, human labour contributed most to total cost (TC) followed by planting material, machine labour and farm yard manure while for maintenance major contribution was of manures and manuring. Variable cost was the major component to the total rearing cost. In Kathua district (2.58), the benefit cost ratio (BCR) was higher in Billawar (2.80) than in Gujroo Nagrota (2.43). In Rajouri (2.66), the same turned out to be higher in Sunderbani (2.91) than Nowshera block (2.66). For Udhampur district (2.90) it was higher in Ghordi (2.99) than Udhampur J (2.44). The study revealed the investment in sericulture as economically viable and commercially feasible as clear from the BCR obtained.

Keywords: Sericulture, silkworm rearing, mulberry garden, human labour, BCR

Introduction

Sericulture is both an art and science of raising silkworms for silk production and is regarded as “Queen of textiles”. It is considered as one of the important sectors of economy in India as it stands for livelihood opportunity for millions owing to its unique characteristics of being eco-friendly, agro-based, high employment oriented, labour intensive, short gestation period, capacity to develop into a family enterprise with low capital investment, high output and reasonably good assured returns. The very nature of this industry with its rural based on-farm and off-farm activities and enormous employment generation potential has attracted the attention of the planners and policy makers to recognize the industry among one of the most appropriate avenues for socio-economic development of a largely agrarian economy like India. Therefore, it is rightly known as “Industry of the poor”.

Government of India has been encouraging regular income and employment oriented farming approaches for providing employment and controlling migration of rural poor to urban areas, one such potential farming enterprise is sericulture for the promotion of which the Government has initiated various programmes, succeeding which the enterprise has taken a rapid stride towards progress, emerging as one of the most economically viable, small scale agro based industries. It has gained a special place among the agro-based cottage industry of our country and has turned out to be a highly remunerative enterprise and promising rural industries that can be carried out in a wide range of agro-climatic regions like forests, hilly areas and plains. As an enterprise it has proven to be righteous under the Indian agro-climatic conditions. The sericulture activity is divided into two sectors viz., farm sector and industry sector. The farm sector involves mulberry cultivation, silkworm egg production, silkworm rearing and disposal of cocoons while the reeling, twisting, dyeing, weaving, printing, knitting form the industry sector (Singh, 1994) [6].

It ensures secured livelihood to more than 7.9 million persons (across 60 thousand villages over India) in rural and semi-urban areas of which a sizeable number of workers belong to the economically weaker sections of society, including women It certainly ensures a dependable livelihood to a large section of low-skilled poor peasants and artisans and can generate employment @ 11 man days per kg of raw silk production (in on-farm and off-farm activities) throughout the year (Savithri *et al.*, 2013) [5]. This potential is par-excellence and no other business generates this type of employment, especially in rural areas, hence, sericulture is used as a tool for rural reconstruction.

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Presently, over 60 countries are practicing sericulture in the world of which the major silk producing countries are China, India, Uzbekistan, Brazil, Japan, Republic of Korea, Thailand, Vietnam, Korea, Iran, etc. Asia is the main producer of silk in the world contributing 95 percent of the total global output, bulk of which comes from China and India. China has come up as the world's single biggest producer and chief supplier of silk to the world markets while India ranks second with respect to silk production (Rattan, 2016) [4].

India has a rich and complex history in silk production and its silk trade dates back to 15th century. India is the second largest producer of silk in the world after China having a share of about 15.49 percent in the global production. India is the only country that can produce all the four commercially known varieties of silk namely, Mulberry, Eri, Tasar, and Muga with an advantage of practicing sericulture all through the year, thus, yielding a stream of about 4-6 crops due to its tropical climate. Silk obtained from sources other than mulberry are generally termed as non-mulberry or "vanya" silks. Due to the prevalence of favourable climatic conditions, mulberry is cultivated mainly in five states of the country namely, Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal and Jammu and Kashmir that jointly account for about 97 percent of each mulberry silk production as well as area under mulberry cultivation. Karnataka is the principal silk producing state which accounts for about 58 percent of the total mulberry raw silk production in the country (Bhat, 2014) [3]. India's traditional and culture bound domestic market and an amazing diversity of silk garments that reflect geographic specificity has helped the country to achieve a leading position in silk industry.

Being one of the traditional occupations of Jammu and Kashmir Sericulture plays an important role in the rural development in J&K having potential to generate attractive income by integrating well with the farming systems. It is practiced in 20 districts of the state out of which major silk producing districts are Anantnag, Kupwara, Pulwama, Baramula, Ganderbal, Udhampur, Rajouri, Reasi and Kathua. It is a subsidiary occupation for about 30455 families and produces about 1032.4 MTs of silk cocoons (Anonymous, 2016) [1, 2]. Most of these families belong to economically backward sections like scheduled castes, schedule tribes and adivasis thus helps them in improving their economic condition. Furthermore, it provides ample employment opportunities during pre and post cocoon activities and thus supplements the income of the farmers in addition to their returns from other crops. Several socio-economic studies have affirmed that the benefit-cost ratio in sericulture is highest among comparable agricultural crops (Ganghopadhyay, 2008). Annually, about 973 MTs of cocoons are produced generating an income of about Rs. 2224 lakh for these silkworm rearers. As far as the total number of silkworm rearers in Jammu region is concerned, it is about 21128 (Anonymous, 2016) [1, 2]. Also it has been estimated that out of total cocoon production only 20-30 percent is consumed within the state and rest is exported (Bhat, 2014) [3]. Based on these considerations the present study was undertaken with the following objective(s):

- To estimate the costs and returns from sericulture farming

Study Area and Methodology

For achieving the objectives of the study multistage sampling technique was used under which three districts namely, Kathua, Rajouri, and Udhampur were selected purposively (at 1st stage) based on maximum number of silkworm rearers engaged in this venture, two development blocks (purposively, at 2nd stage), 3 villages from each selected block (randomly, at 3rd stage) and finally 90 silkworm rearers (15 from each village) from each selected district comprising a total sample of 270 silkworm rearers were selected randomly.

Analytical Procedure

Computation of costs and returns

For the computation of costs and returns, various cost concepts framed by CACP were used and the input items included under each category of cost are indicated below:

Cost A1 = Hired human labour, hired and owned bullock labour, hired and owned machine labour, value of farmyard manure, value of chemical fertilizers, Irrigation, value of plant protection, land revenue, depreciation charges, value of seed (DFLs), value of disinfectants, interest on working capital, other miscellaneous cash expenses.

Cost A2 = Cost A1 + rental value of leased in land

Cost B1 = Cost A2 + interest on fixed capital

Cost B2 = Cost B1 + rental value of owned land

Cost C1 = Cost B1 + imputed value of family labour

Cost C2 = Cost B2 + imputed value of family labour

Results and Discussion

Cost structure of sericulture farming in study area

Establishment cost of Mulberry Garden(Kathua district)

In Kathua district, village wise and block wise establishment cost of mulberry garden (Table 1) revealed that out of two development blocks, the total cost was higher in Gujroo Nagrota (Rs. 15055.50) than in Billawar (Rs. 14095.96). Further, Tharakalwal village (Rs. 18101.73) reported highest figure for the same followed by Barota (Rs. 16875.14) and Sialna (Rs. 12634.97) in Gujroo Nagrota. However, in Billawar block, highest figure was found in Durang (Rs. 17310.98) and lowest in Mandli (Rs. 12093.08). The establishment cost for the district stood at Rs. 14099.96. Similar trend in respective villages with respect to various inputs used for the establishment of mulberry garden was observed with highest share of human labour followed by planting material and machine labour to the total cost. Similar results have also been reported by Hosali and Murthy (2015).

Maintenance cost of Mulberry Garden

The per year maintenance cost of mulberry garden (Table 2) indicates that of the various inputs used, the highest share to the total maintenance cost was of manures and manuring. The total maintenance cost was slightly higher in Nagrota (Rs. 4508.54) than in Billawar (Rs. 4490.75). Among villages it was highest in Tharakalwal village (Rs. 4702.49) and least in Sialna (Rs. 3835.80) of Nagrota block while in Billawar it was highest in Kishanpur (Rs. 5330.41) and lowest in Durang (Rs. 4265.80) with overall figure for the district as 4480.14. The expenditure made by the sericulturists for fertilizers and their application was found to be little lesser as compared to the expenditure made on manures.

Table 1: Establishment cost of mulberry garden in selected villages of Kathua district (Rs. /acre)

Sr. No.	Particulars	Gujroo Nagrota				Billawar				Kathua
		Tharakalwal	Barota	Sialna	Overall	Kishanpur	Mandli	Durang	Overall	
i)	Human labour (family)	6752.00	6400.01	4022.08	4854.08	4668.13	3835.52	6595.20	4322.18	4520.51
ii)	Machine labour	2857.14	2000.00	1578.95	2022.47	3157.89	2000.00	2500.00	2465.75	2100.23
iii)	Saplings/Planting material	3850.00	4600.00	3600.00	3973.00	3360.00	2440.00	4040.00	3200.00	3380.56
iv)	Farm yard manure (FYM)	2275.45	1749.84	1625.26	2125.35	2783.21	2025.22	1825.36	2075.69	2086.49
v)	Fertilizer	826.92	689.45	733.61	799.57	893.65	763.38	877.48	832.96	812.45
vi)	Interest on working capital	1540.22	1435.85	1075.07	1281.03	1382.25	1028.96	1472.94	1199.38	1199.72
	Total	18101.73	16875.14	12634.97	15055.50	16245.13	12093.08	17310.98	14095.96	14099.96

Table 2: Per year maintenance cost of mulberry garden in selected villages of Kathua district (Rs./acre)

A.	Maintenance cost (2 nd year onwards)	Gujroo Nagrota				Billawar				Kathua
		Tharakalwal	Barota	Sialna	Overall	Kishanpur	Mandli	Durang	Overall	
i)	Manures and manuring	3075.45	2549.84	2375.81	2925.35	3583.21	2825.22	2625.36	2875.69	2886.49
ii)	Fertilizers and its application	1226.92	1089.45	1133.61	1199.57	1293.65	1163.38	1277.48	1232.96	1212.45
iii)	Interest on working capital	400.12	338.45	326.38	383.62	453.55	370.94	362.96	382.10	381.20
	Total	4702.49	3977.74	3835.80	4508.54	5330.41	4359.54	4265.80	4490.75	4480.14

Cost of Silkworm Rearing/Cocoon Production

The economics of silkworm rearing in terms of costs incurred and returns generated per ounce from silkworm rearing and dry cocoon production are presented in the Table 3. The total cost (TC) of cocoon production was found to the tune of Rs. 9495.00 in Nagrota and Rs. 8500.78 in Billawar with the figure for the district as Rs. 8953.03. In respective villages, TC was highest in Tharakalwal (Rs. 9509.57) and least in Barota (Rs. 9464.10) of Nagrota while in Billawar, Mandli reported highest figure (Rs. 8610.17) for the same followed by Kishanpur (Rs. 8582) and Durang (Rs. 7961.98). Of the various items of variable cost, human labour was the major component followed by leaf cost, disease free layings and transportation and marketing cost (in study area). Similar results have been reported by Purushotham and Rao (2009). Human labour constituted 65 percent in Nagrota, 60 percent in Billawar and 63 percent in Kathua to the VC. Whereas leaf cost contributed 14 percent, 17 percent and 16 percent to VC in Nagrota, Billawar and Kathua district, respectively. The least contribution to VC was of waste newspaper.

Concept wise Costs and Profits from Cocoon Production

The cost distribution of silk cocoon production is presented in the Table 4. The yield (per ounce) was found highest in Barota village (28.67 kgs) and lowest in Tharakalwal (24.93 kgs) of Nagrota block whereas in Billawar, it was highest in Durang village (25.78 kgs) and lowest in Mandli (25.49 kgs). Of the two blocks the yield was higher in Billawar (25.77 kgs) than Nagrota (24.95 kgs) with overall average of the district as 24.93 kgs. Similarly the gross income (GI) was higher in Billawar (Rs. 23841.57) than in Nagrota (Rs. 23078.13) with overall average of the district as Rs. 23063.33. In Nagrota highest income was observed in Barota (Rs. 26517.90) and lowest in Tharakalwal (Rs. 23064.57) while it was highest in Durang (Rs. 23844.03) and lowest in Mandli village (Rs. 23581.33) of Billawar. Similar results have also been reported by Hosali and Murthy (2015).

The net income (Table 4) over various costs indicated same trend as was followed by GI in respective villages however for district it was Rs. 14110.30.

Table 3: Cost structure of silkworm rearing in selected villages of Kathua district (Rs./ounce)

Sr. No.	Items	Gujroo Nagrota				Billawar				Kathua
		Tharakalwal	Barota	Sialna	Overall	Kishanpur	Mandli	Durang	Overall	
1.	Fixed cost	1222.26	1373.16	1271.81	1291.76	1195.97	1378.43	1188.31	1343.28	1319.22
i)	Depreciation on rearing house and equipments	1113.17	1250.60	1158.3	1176.47	1089.23	1255.40	1082.25	1231.75	1205.93
ii)	Interest on fixed capital	109.09	122.56	113.51	115.29	106.74	123.03	106.06	111.53	113.29
2.	Variable cost	8287.31	8090.94	8193.52	8203.24	7386.03	7231.74	6773.67	7157.50	7633.81
i)	Human labour (family)	5879.14	5146.22	5341.24	5412.19	4636.71	4429.20	4055.06	4356.66	4849.63
ii)	Leaf cost*	1208.79	1275.60	1217.59	1223.55	1213.74	1285.54	1185.89	1259.02	1246.10
iii)	Disease free layings (DFLs)	448.82	516.02	492.34	449.09	460.25	458.88	463.99	463.94	448.80
iv)	Disinfectants	257.14	260.00	210.16	237.60	233.42	237.60	253.50	242.16	240.03
v)	Waste newspaper	74.28	60.89	96.00	62.96	61.16	55.60	53.67	56.66	59.60
vi)	Coal	168.57	191.11	150.81	168.00	143.23	137.00	100.83	125.57	145.38
vii)	Transportation and marketing	622.85	611.11	639.48	619.45	610.15	601.12	635.63	626.96	615.98
vii)	Interest on working capital	30.71	29.99	30.37	30.40	27.37	26.80	25.10	26.53	28.29
	Total cost	9509.57	9464.10	9465.33	9495.00	8582.00	8610.17	7961.98	8500.78	8953.03

Note: * Includes both imputed and purchased value of leaves

Table 4: Distribution of costs and measure of profits from silkworm rearing in selected villages of Kathua district (Rs./ounce)

Items	Gujroo Nagrota				Billawar				Kathua
	Tharakalwal	Barota	Sialna	Overall	Kishanpur	Mandli	Durang	Overall	
Yield (kg)	24.93	28.67	27.35	24.95	25.57	25.49	25.78	25.77	24.93
Gross Income	23064.57	26517.90	25300.60	23078.13	23651.63	23581.33	23844.03	23841.57	23063.33
Cost (Rs./ounce)									
Cost A1	3924.34	4195.32	4010.58	3967.52	3838.55	4057.94	3800.87	4032.59	3990.12
Cost A2	3924.34	4195.32	4010.58	3967.52	3838.55	4057.94	3800.87	4032.59	3990.12
Cost B1	4033.43	4317.88	4124.09	4082.81	3945.29	4180.97	3906.93	4144.12	4103.41
Cost B2	4033.43	4317.88	4124.09	4082.81	3945.29	4180.97	3906.93	4144.12	4103.41
Cost C1	9509.57	9464.10	9465.33	9495.00	8582.00	8610.17	7961.98	8500.78	8953.03
Cost C2	9509.57	9464.10	9465.33	9495.00	8582.00	8610.17	7961.98	8500.78	8953.03
Net Income over above cost concepts (Rs./ounce)									
Cost A1	19140.22	22322.58	21290.02	19110.61	19813.08	19523.39	20043.17	19808.98	19073.22
Cost A2	19140.22	22322.58	21290.02	19110.61	19813.08	19523.39	20043.17	19808.98	19073.22
Cost B1	19031.13	22200.02	21176.51	18995.32	19706.34	19400.36	19937.11	19697.45	18959.93
Cost B2	19031.13	22200.02	21176.51	18995.32	19706.34	19400.36	19937.11	19697.45	18959.93
Cost C1	13554.99	17053.80	15835.27	13583.13	15069.63	14971.16	15882.05	15340.79	14110.30
Cost C2	13554.99	17053.80	15835.27	13583.13	15069.63	14971.16	15882.05	15340.79	14110.30
Benefit cost ratio									
Cost A1	5.88	6.32	6.31	5.82	6.16	5.81	6.27	5.91	5.78
Cost A2	5.88	6.32	6.31	5.82	6.16	5.81	6.27	5.91	5.78
Cost B1	5.72	6.14	6.13	5.65	5.99	5.64	6.10	5.75	5.62
Cost B2	5.72	6.14	6.13	5.65	5.99	5.64	6.10	5.75	5.62
Cost C1	2.43	2.80	2.67	2.43	2.76	2.74	2.99	2.80	2.58
Cost C2	2.43	2.80	2.67	2.43	2.76	2.74	2.99	2.80	2.58

The benefit-cost ratio (BCR) over various costs is also worked out which shows that it was highest in Barota (2.80) and lowest in Tharakalwal (2.43) village of Nagrota block (2.43). Whereas in Billawar (2.80) it was highest in Durang (2.99) and lowest in Mandli (2.74). For the district the figure stood at 2.58.

Establishment cost of Mulberry Garden (Rajouri district)

The operation wise establishment cost of mulberry garden in Rajouri district (Table 5) indicated higher TC in Nowshera (Rs. 13577.90) than Sunderbani block (Rs. 12627.50) with overall average of the district as Rs. 12948.80. In respective villages it turned out to be highest in Kangri (Rs. 13683.16) and lowest in Lower Hathal (Rs. 12230.60) of Sunderbani block while in Nowshera the highest figure was recorded in Kalsian (Rs. 13949.70) and lowest in Saryia (Rs. 13200.80). Labour cost was the major item of the operational cost followed by the expenditure on planting material in respective villages in both the blocks and the district as well.

Maintenance cost of Mulberry Garden

The total maintenance cost (Table 6) was highest in Lower

Hathal (Rs. 4828.60) and lowest in Thandapani (Rs. 3958.83) in Sunderbani (Rs. 4348.14) while in Nowshera (Rs. 4506.05) it was highest in Kalsian (Rs. 4843.36) and lowest in Saryia (Rs. 4240.26). The overall average figure for the district was Rs. 4441.61. Of the two components used for maintaining the mulberry garden, manures and manuring contributed high i.e. 64.79 percent, 64.95 percent and 64.81 percent in Sunderbani, Nowshera and Rajouri, respectively than fertilizers that contributed 28.46, 28.36 and 28.49 in Sunderbani, Nowshera and Rajouri, respectively to the total cost.

Cost of Silkworm Rearing

In cocoon production (Table 7) VC constituted 84.99 percent, 85.29 percent and 85.10 percent in Sunderbani, Nowshera and Rajouri, respectively. The human labour contribution was found almost same i.e. 60 percent in the two blocks and district Sunderbani, Nowshera and Rajouri. Similarly leaf cost constituted 18.64 percent to VC in Sunderbani, Nowshera and Rajouri, respectively.

Table 5: Establishment cost of mulberry garden in selected villages of Rajouri district (Rs./acre)

Sr. No.	Particulars	Sunderbani				Nowshera				Rajouri
		Lower Hathal	Kangri	Thandapani	Overall	Nonial	Saryia	Kalsian	Overall	
i)	Human labour (family)	3200.00	4416.00	4640.00	3680.00	4448.00	3680.00	4288.00	4224.00	3808.00
ii)	Machine labour	2222.22	2400.00	1700.00	2043.48	1800.00	2666.67	2000.00	2078.95	2059.52
iii)	Saplings/Planting material	2550.00	2435.00	3360.00	2975.00	3140.00	2985.00	3135.00	3115.00	3035.00
iv)	Farm yard manure (FYM)	2329.80	2428.30	1648.35	2016.99	1827.37	1978.80	2482.89	2126.78	2078.84
v)	Fertilizer	887.94	839.60	793.27	837.57	939.38	767.08	856.90	877.91	865.67
vi)	Interest on working capital	1040.67	1164.26	1129.17	1074.43	1130.39	1123.21	1186.94	1155.31	1101.77
	Total	12230.60	13683.16	13270.80	12627.50	13285.10	13200.80	13949.70	13577.90	12948.80

Table 6: Per year maintenance cost of mulberry garden in selected villages of Rajouri district (Rs./acre)

Sr. No.	Particulars	Sunderbani				Nowshera				Rajouri
		Lower Hathal	Kangri	Thandapani	Overall	Nonial	Saryia	Kalsian	Overall	
i)	Mannures and manuring	3129.80	3228.30	2448.35	2816.99	2627.37	2778.80	3282.89	2926.78	2878.84
ii)	Fertilizers and its application	1287.94	1239.60	1193.27	1237.57	1339.38	1167.09	1256.90	1277.91	1265.67
iii)	Interest on working capital	410.85	293.35	317.21	293.58	303.50	294.37	303.57	301.36	297.10
	Total	4828.60	4761.25	3958.83	4348.14	4270.25	4240.26	4843.36	4506.05	4441.61

Concept wise Costs and Profits from Cocoon Production

The returns from cocoon production along with the distribution of costs (Table 8) indicated that per ounce yield was higher in Nowshera (27.09 kgs) than Sunderbani (25.43 kgs) with overall average of the district as 25.02 kgs. In respective villages of the blocks it was found highest in Thandapani (25.88 kgs) and lowest in Lower Hathal (24.97 kgs) in Sunderbani block whereas it was highest in Saryia (27.09 kgs) and lowest in Kalsian (26.98 kgs) village of Nowshera block. Similarly the gross income from cocoon production in Sunderbani (Rs. 23648) was found highest in Thandapani (Rs. 24069.60) and lowest in Lower Hathal (Rs. 23221.50). Whereas, in the Nowshera block the highest figure was recorded in Saryia (Rs. 25195.60) and lowest in Kalsian (Rs. 25088.90) with overall average of the block as Rs. 25193.10. When compared between the two blocks it was found higher in Nowshera (Rs. 25193.10) than in Sunderbani (Rs. 23648.00) with overall average of the district as Rs. 23268.60.

The net income over various costs followed same trend as GI in respective villages of the blocks. The overall net income

over cost C for the Sunderbani and Nowshera blocks turned out to be Rs. 14754.44 and Rs. 16521.39, respectively while for the district it stood at Rs. 14508.24.

The benefit-cost ratio over cost C was observed to be highest in Thandapani (2.99) and lowest in Lower Hathal (2.42) Sunderbani block, while in Nowshera block was found highest in Saryia (2.99) and lowest in Kalsian (2.82). Of the two blocks BCR was found higher in Nowshera (2.91) than Sunderbani (2.66) with figure for the district as 2.66.

Establishment cost of Mulberry Garden (Udhampur district)

The establishment cost of mulberry garden in Udhampur district (Table 9) indicates that sericulture farmers incurred a total cost of Rs. 13216.30, Rs. 12889.40 and Rs. 13335.00 in Udhampur, Udhampur J and Ghordi block, respectively. In respective villages of Udhampur J block, the highest TC was observed in Madolth (Rs. 18364.40) and lowest in Sunal (Rs. 12108.20) while in Ghordi block, the highest figure for the same was recorded in Jandror (Rs. 16217.80) and lowest in Masal (Rs. 12323.50).

Table 7: Cost structure of cocoon production in selected villages of Rajouri district (Rs. /ounce)

Sr. No.	Items	Sunderbani				Nowshera				Rajouri
		Lower Hathal	Kangri	Thandapani	Overall	Nonial	Saryia	Kalsian	Overall	
1.	Fixed cost	1348.47	1419.45	1275.43	1334.93	1348.47	1123.73	1398.42	1275.58	1305.05
i)	Depreciation on rearing house and equipments	1228.12	1292.76	1161.60	1215.78	1228.12	1023.43	1273.61	1161.73	1188.57
ii)	Interest on fixed capital	120.36	126.69	113.84	119.15	120.36	100.30	124.81	113.85	116.48
2.	Variable cost	8241.50	8140.38	6763.69	7558.67	7397.81	7299.77	7510.6	7396.11	7455.31
i)	Human labour (family)	5007.96	4975.16	4078.63	4592.04	4531.63	4298.13	4509	4437.77	4514.38
ii)	Leaf cost*	1604.63	1583.85	1184.02	1409.31	1282.37	1473.22	1309.47	1368.46	1389.70
iii)	Disease free layings (DFLs)	449.45	465.58	465.86	457.70	487.18	487.66	485.59	487.61	450.36
iv)	Disinfectants	270.00	252.95	239.63	252.25	254.57	231.43	264.00	248.11	250.16
v)	Waste newspaper	56.18	72.63	52.88	59.01	60.43	54.86	70.00	60.65	59.84
vi)	Coal	186.36	123.68	81.25	123.97	117.86	91.07	208.33	129.73	126.87
vii)	Transportation and marketing	636.36	636.36	636.36	636.36	636.36	636.36	636.36	636.36	636.36
viii)	Interest on working capital	30.54	30.17	25.07	28.01	27.42	27.05	27.84	27.41	27.63
	Total cost	9589.97	9559.82	8039.12	8893.60	8746.29	8423.50	8909.02	8671.69	8760.36

Note: * Includes both imputed and purchased value of leaves

Table 8: Distribution of costs and measure of profits from silkworm rearing in selected villages of Rajouri district (Rs./ounce)

Items	Sunderbani				Nowshera				Rajouri
	Lower Hathal	Kangri	Thandapani	Overall	Nonial	Saryia	Kalsian	Overall	
Yield (kg)	24.97	25.87	25.88	25.43	27.07	27.09	26.98	27.09	25.02
Gross Income	23221.50	24054.80	24069.60	23648.00	25170.80	25195.60	25088.90	25193.10	23268.60
Cost (Rs./ounce)									
Cost A1	4461.65	4457.98	3846.66	4182.41	4094.30	4025.08	4275.20	4120.07	4129.50
Cost A2	4461.65	4457.98	3846.66	4182.41	4094.30	4025.08	4275.20	4120.07	4129.50
Cost B1	4582.01	4584.67	3960.49	4301.55	4214.66	4125.38	4400.02	4233.92	4245.98
Cost B2	4582.01	4584.67	3960.49	4301.55	4214.66	4125.38	4400.02	4233.92	4245.98
Cost C1	9589.97	9559.82	8039.12	8893.60	8746.29	8423.50	8909.02	8671.69	8760.36
Cost C2	9589.97	9559.82	8039.12	8893.60	8746.29	8423.50	8909.02	8671.69	8760.36
Net Income over above cost concepts (Rs./ounce)									
Cost A1	18759.83	19596.78	20222.98	19465.63	21076.46	21170.48	20813.72	21073.01	19139.10
Cost A2	18759.83	19596.78	20222.98	19465.63	21076.46	21170.48	20813.72	21073.01	19139.10
Cost B1	18639.47	19470.09	20109.15	19346.49	20956.10	21070.18	20688.90	20959.16	19022.62
Cost B2	18639.47	19470.09	20109.15	19346.49	20956.10	21070.18	20688.90	20959.16	19022.62

Cost C1	13631.51	14494.94	16030.52	14754.44	16424.47	16772.06	16179.90	16521.39	14508.24
Cost C2	13631.51	14494.94	16030.52	14754.44	16424.47	16772.06	16179.90	16521.39	14508.24
Benefit cost ratio									
Cost A1	5.20	5.40	6.26	5.65	6.15	6.26	5.87	6.11	5.63
Cost A2	5.20	5.40	6.26	5.65	6.15	6.26	5.87	6.11	5.63
Cost B1	5.07	5.25	6.08	5.50	5.97	6.11	5.70	5.95	5.48
Cost B2	5.07	5.25	6.08	5.50	5.97	6.11	5.70	5.95	5.48
Cost C1	2.42	2.52	2.99	2.66	2.88	2.99	2.82	2.91	2.66
Cost C2	2.42	2.52	2.99	2.66	2.88	2.99	2.82	2.91	2.66

The highest share in total cost was of human labour followed by planting material as observed in other two districts. The highest and lowest labour cost among the villages of Udhampur J was found in Madolth (Rs. 6880.48) and Sunal (Rs. 3680.86), respectively while in Ghordi block it was highest in Jandror (Rs. 6336.56) and lowest in Masal (Rs. 3699.24). When compared between the blocks it was observed higher in Ghordi (Rs. 3840.58) than in Udhampur J (Rs. 3712.85) with overall average of the district as Rs. 3808.78.

Maintenance cost of Mulberry Garden

The per year maintenance cost of mulberry garden (Table 10) was noticed higher in Ghordi block (Rs. 4896.36) as compared to Udhampur J (Rs. 4823.01) with overall average of the district as Rs. 4872.88. Of this total maintenance cost the highest expenditure was noticed on manures and manuring as compared to expenditure made on fertilizers.

Cost of Silkworm Rearing

The cost structure of cocoon production in Udhampur district (Table 11) indicated that the variable and fixed cost

constituted 87.31 and 12.69 percent to TC in Udhampur J and 84.84 and 15.16 percent in Ghordi block, respectively while at district level it constituted 85.80 percent and 14.19 percent, respectively to the total cost. Among various items of the variable cost the highest share was of human labour and the leaf cost occupied the second place in the respective villages of the blocks as well as in the district. The human labour contributed 63 percent, 59.22 percent and 61.92 percent in Udhampur J, Ghordi and Udhampur, respectively to VC. Whereas the leaf cost constituted 17, 18 and 16 percent to VC in Udhampur J, Ghordi and Udhampur, respectively.

Concept wise Costs and Profits from Cocoon Production

The returns from cocoon production in Udhampur district (Table 12) revealed that the yield per ounce was higher in Ghordi (24.23 kgs) than Udhampur J (24 kgs) block. While in respective villages of Udhampur J it was found highest in Madolth (24.70 kgs) and lowest in Sunal (23.95 kgs) while in Ghordi block it was highest in Masal (23.33 kgs) and lowest in Harttiyan (23.14 kgs) with overall average of the district as 25.20 kgs.

Table 9: Establishment cost of mulberry garden in selected villages of Udhampur district (Rs./acre)

Sr. No.	Particulars	Udhampur-J				Ghordi				Udhampur
		Bassan	Madolth	Sunal	Overall	Jandror	Masal	Hartiyan	Overall	
i)	Human labour (family)	6272.89	6880.48	3680.86	3712.85	6336.56	3699.24	4000.28	3840.58	3808.78
ii)	Machine labour	2600.00	2488.89	1808.00	2022.22	1743.59	2250.00	2344.83	2080.00	2064.71
iii)	Saplings/Planting material	3840.00	4615.00	2135.00	2845.00	3915.00	2395.00	2445.00	3000.00	2960.00
iv)	FYM	2494.82	1947.25	2578.35	2343.65	1977.35	2046.80	2626.80	2378.40	2368.41
v)	Fertilizer	866.91	870.21	875.74	868.98	865.36	883.89	946.36	901.35	889.85
vi)	Interest on working capital	1494.94	1562.57	1030.25	1096.72	1379.92	1048.57	1149.78	1134.63	1124.53
	Total	17569.60	18364.40	12108.20	12889.40	16217.80	12323.50	13513.10	13335.00	13216.30

Table 10: Per year maintenance cost of mulberry garden in selected villages of Udhampur district (Rs./acre)

Sr. No.	Particulars	Udhampur-J				Ghordi				Udhampur
		Bassan	Madolth	Sunal	Overall	Jandror	Masal	Hartiyan	Overall	
i)	Mannures and manuring	3294.82	2747.25	3378.35	3143.65	2777.35	2846.80	3426.80	3178.40	3168.41
ii)	Fertilizers and its application	1266.91	1270.21	1275.74	1268.98	1265.36	1283.89	1346.36	1301.35	1289.85
iii)	Interest on working capital	424.24	373.62	432.83	410.37	375.97	384.15	443.90	416.62	414.62
	Total	4985.97	4391.08	5086.92	4823.01	4418.68	4514.84	5217.07	4896.36	4872.88

Table 11: Cost structure of silkworm rearing/cocoon production in selected villages of Udhampur district (Rs./ounce)

Sr. No.	Items	Udhampur J				Ghordi				Udhampur
		Bassan	Madolth	Sunal	Overall	Jandror	Masal	Hartiyan	Overall	
1.	Fixed cost	1150.70	1131.22	1298.53	1183.44	1110.51	1207.21	1179.92	1166.01	1172.96
i)	Depreciation on rearing house and equipments	1047.99	1030.26	1182.63	1077.81	1011.39	1099.46	1074.60	1061.94	1068.27
ii)	Interest on fixed capital	102.70	100.96	115.90	105.63	99.12	107.75	105.31	104.07	104.69
2.	Variable cost	7972.63	7963.96	8644.35	8143.64	6344.61	6202.61	6945.55	6527.03	7089.81
i)	Human labour (family)	5056.22	5140.05	5406.96	5180.48	3774.87	3615.25	4236.21	3865.72	4390.06
ii)	Leaf cost*	1414.83	1314.37	1523.76	1409.67	1086.63	1114.66	1251.20	1161.46	1180.83
iii)	Disease free layings (DFLs)	441.86	444.53	431.04	432.02	417.86	420.02	416.54	436.06	453.60
iv)	Disinfectants	216.00	177.75	369.00	243.40	223.85	220.99	215.48	222.96	223.11
v)	Waste newspaper	46.56	61.50	56.00	54.45	57.88	70.87	66.00	68.99	57.36
vi)	Coal	147.60	171.25	180.00	164.78	135.88	134.97	121.88	134.58	139.29

vii)	Transportation and marketing	620.00	625.00	645.56	628.66	624.12	602.86	612.50	613.07	619.29
vii)	Interest on working capital	29.55	29.52	32.04	30.18	23.51	22.99	25.74	24.19	26.28
	Total cost	9123.33	9095.18	9942.89	9327.08	7455.12	7409.81	8125.47	7693.04	8262.77

Note: * Includes both imputed and purchased value of leaves

Table 12: Distribution of costs and profits from silkworm rearing in selected villages of Udhampur district (Rs./ounce)

Items	Udhampur J				Ghordi				Udhampur
	Bassan	Madolth	Sunal	Overall	Jandror	Masal	Hartiyan	Overall	
Yield (kg)	24.55	24.70	23.95	24.00	23.21	23.33	23.14	24.23	25.20
Gross Income	23320.60	23461.20	22749.30	22801.30	22053.90	22167.90	21984.30	23014.10	23940.00
Cost (Rs./ounce)									
Cost A1	3964.40	3854.17	4420.03	4040.97	3581.13	3686.82	3783.94	3723.25	3768.02
Cost A2	3964.40	3854.17	4420.03	4040.97	3581.13	3686.82	3783.94	3723.25	3768.02
Cost B1	4067.10	3955.13	4535.93	4146.60	3680.25	3794.57	3889.26	3827.32	3872.71
Cost B2	4067.10	3955.13	4535.93	4146.60	3680.25	3794.57	3889.26	3827.32	3872.71
Cost C1	9123.33	9095.18	9942.89	9327.08	7455.12	7409.81	8125.47	7693.04	8262.77
Cost C2	9123.33	9095.18	9942.89	9327.08	7455.12	7409.81	8125.47	7693.04	8262.77
Net Income over above cost concepts (Rs./ounce)									
Cost A1	19356.20	19607.03	18329.30	18760.29	18472.80	18481.11	18200.32	19290.82	20171.98
Cost A2	19356.20	19607.03	18329.30	18760.29	18472.80	18481.11	18200.32	19290.82	20171.98
Cost B1	19253.50	19506.07	18213.40	18654.67	18373.68	18373.37	18095.01	19186.75	20067.29
Cost B2	19253.50	19506.07	18213.40	18654.67	18373.68	18373.37	18095.01	19186.75	20067.29
Cost C1	14197.27	14366.02	12806.45	13474.19	14598.81	14758.12	13858.80	15321.03	15677.23
Cost C2	14197.27	14366.02	12806.45	13474.19	14598.81	14758.12	13858.80	15321.03	15677.23
Benefit cost ratio									
Cost A1	5.88	6.09	5.15	5.64	6.16	6.01	5.81	6.18	6.35
Cost A2	5.88	6.09	5.15	5.64	6.16	6.01	5.81	6.18	6.35
Cost B1	5.73	5.93	5.02	5.50	5.99	5.84	5.65	6.01	6.18
Cost B2	5.73	5.93	5.02	5.50	5.99	5.84	5.65	6.01	6.18
Cost C1	2.56	2.58	2.29	2.44	2.96	2.99	2.71	2.99	2.90
Cost C2	2.56	2.58	2.29	2.44	2.96	2.99	2.71	2.99	2.90

The GI was found higher in Ghordi (Rs. 23014.10) than Udhampur J (Rs. 22801.30) and Rs. 23940.00 in district. In Udhampur J the same was found highest in Madolth (Rs. 23461.20) and lowest in Sunal (Rs. 22749.30) while in Ghordi it was highest in Masal (Rs. 22167.90) and lowest in Hartiyan (Rs. 21984.30).

The net income over cost C was found higher for Ghordi block (Rs. 15321.03) as compared to Udhampur J (Rs. 13474.19). However, for the district it worked out to be Rs. 15677.23.

The BCR over cost C was recorded highest in Madolth (2.58) and lowest in Sunal (2.29) of Udhampur J (2.44) whereas it was highest in Masal (2.99) and lowest in Hartiyan (2.71) in Ghordi block (2.99). However, for the district the figure turned out to be as 2.90.

Conclusion

The study has highlighted the importance of rural agro based cottage industry i.e. sericulture that stands for livelihood opportunity for millions owing to its unique characteristics of being agro-based, high employment oriented, labour intensive, short gestation period, capacity to develop into a family enterprise with low capital investment, high output and reasonably good assured returns. The enterprise has enormous employment generation potential with its rural based on-farm and off-farm activities. The study has revealed that in the study area for the establishment of mulberry garden highest expenditure was made by sericulture farmers on human labour followed by planting material, machine labour and farm yard manure. While the per year maintenance cost indicated that manures and manuring contributed majorly to the total cost as compared to fertilizers. Variable cost was the major component of the total rearing cost. Further, of the various

cost components of VC, the major contribution was of human labour followed by leaf cost, transportation and marketing, Disease Free Layings (DFLs), disinfectants, coal and waste newspaper in respective villages and blocks of the districts. Furthermore, the benefit cost ratio (BCR) obtained in sericulture farming was found more than one indicating that the investment in this venture (i.e. sericulture) is economically viable and commercially feasible. In Kathua district, the BCR was found higher in Billawar block (2.80) than Gujroo Nagrota (2.43) and for the it was 2.58. In Rajouri it was observed to be higher in Nowshera (2.91) than Sunderbani (2.66) with 2.66 for the district. In Udhampur it turned out to be higher in Ghordi (2.99) compared to Udhampur J (2.44) and for the district it was found as 2.90. If compared among the districts it was noticed to be highest in Udhampur district (2.90) followed by Rajouri (2.66) and Kathua (2.58).

References

1. Anonymous. Department of Sericulture, Government of J&K; c2016.
2. Anonymous. Digest of Statistics. Directorate of Economics and Statistics, Planning and Development Department, Govt. of Jammu and Kashmir; c2016.
3. Bhat TA. An Analysis of Public Private Partnership in Sericulture in Jammu and Kashmir State (India). Journal of Economics and Sustainable Development, 2014;5(11):121-126.
4. Rattan M. Economic Analysis of Bivoltine Cocoon Production in Bilaspur District of Himachal Pradesh. M.Sc. (Agri.) Thesis, CSKHPKV, Palampur, H.P.; c2016.
5. Savithri G, Sujathamma P, Neeraj P. Indian Sericulture Industry for Sustainable Rural Economy. International

- Journal of Economics, Commerce and Research, 2013;3(2):73-78.
6. Singh S. Appraisal of Sericulture in Rajasthan. Institute of Development Studies, Jaipur (mimeo); c1994.
 7. Ganghopadhyay D. Sericulture industry in India- An overview. India, Science and Technology; c2008.
 8. Hosali R, Murthy C. Trends in arrivals and prices of cocoons in Shirahatti market at Haveri district. International Journal of Commerce & Business Management; c2015;8(1):131-134.
 9. Purushotham S, Rao RMP. Economics of sericulture in Ananthapur district of Andhra Pradesh. Agricultural Science Digest; c2009;29(2):120-122.