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RESEARCH PAPER

Analysis of Costs and Returns from Silk Weaving in the State of Assam

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ABSTRACT

Assam is the largest producer of Muga silk amongst the states of India and the state is known for producing high-quality silk since ancient times. The state also has monopoly in producing all four types of silk which creates job possibilities at all stages of the process i.e. growing, raising, reeling and weaving. The present study was conducted in Assam to analyze different costs and returns from silk weaving using cost concepts. The study was conducted at Sualkuchi Development block of Kamrup district of Assam. A total of 100 samples were selected randomly to substantiate the object of the study and entire sample was divided into four size groups based on number of looms owned by the respondents. The findings of the study revealed that the total annual cost per loom was ₹ 41013.79, while the gross income and net income per loom were estimated to be ₹ 68376.91 and ₹ 27363.12, respectively. Overall average variable cost per loom was ₹ 36458.60. Among the variable inputs, cost of yarn accounted for 58.47 per cent of the total variable cost followed by the cost of labour (32.58 per cent), miscellaneous cost (1.32 per cent), cost of electricity (0.92 per cent) and cost of dye (0.88 per cent) respectively.

HIGHLIGHTS

- Silk weaving was highly cost and labor-intensive enterprise.
- Out of the total cost, the highest cost was incurred for yarn and dye which were the most important variable inputs of weaving.
- Both the net income over variable cost and net income over total cost were seen to have increased with the increase in loom size.

Keywords: Silk weaver, handloom, cost and return, total annual cost, gross income, net income

The practice of weaving has been in existence for more than 5000 years in India. It has played a key role in our culture and has a glorious history. India's weaving industry currently ranks third in the world, contributing significantly to the economy of the country (Das, 2015). Out of 139 crore population of India, currently around 56 lakhs people rely on the sericulture sector and it has become increasingly important for the economic development of the country. India occupies a unique position in the world in terms of high-quality silk production. The country stands as the second-largest producer of silk after China, accounting for around 18% of total global production (Gera, 2019). Muga silk is

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mainly found in the North-Eastern states of the country, and Assam appears as the largest producer of Muga amongst the states of India. Assam ranks 3rd in production of raw silk, producing around 3897 MT of raw silk in the year 2019-20, accounting for about 10.87 per cent of total India's production (Central Silk Board, 2019-20).

The textile industry in India is divided into two categories; viz., organized sector, comprising composite textile mills, and unorganized sector, comprising handlooms and power looms. Handloom weaving is one of most lively components of the country's rich cultural history and it is one-of-a-kind in terms of producing high-quality goods with an aesthetic touch. Handlooms and power looms contribute around 95 per cent of the total textile production, while the rest 5 per cent is shared by the organized textile mills. According to Textile Commissioner Report (2019) handloom has the highest share (52 per cent) in total loom units in India followed by power loom (46 per cent) and shuttle-less loom (2 per cent). Bhavya (2017) from his study reported that handloom products had the biggest share of weavers in customers' rupee in comparison to power loom products. The average annual income of power loom weavers (₹ 15,53,412) from various sources was higher than that of handloom weavers (₹ 11,89,213.51), where weaving accounted for 98 per cent of income.

The scenario in Assam is partially different where handlooms dominate weaving sector accounting about 99 per cent, while power loom occupies only 0.22 per cent of the total looms. As per reports of Fourth All India Handloom Census (2019-20),Assam is having around 12.48 lakh handloom units and 11.07 lakhs handloom workers contributing around 44.23 per cent and 37.9 per cent to the total handloom units and workers in India, and was estimated to be the highest among the states of the country. Along with providing a source of livelihood to a large number of people, the handloom industry also establishing scope of earning a handsome amount of foreign exchange through export. This indicates that silk industry plays an important role in the rural economy of the state of Assam.Thus, the present study was undertaken to analyze cost and return from silk weaving of the silk weavers in the state of Assam.

METHODOLOGY

Sualkuchi development block of Kamup district of Assam is a cluster of weavers and is known as Manchester of the Assam. Sualkuchi area is famous for its high-quality *Muga* and *Pat* (Mulberry) silks, as well as Eri silk and Endi fabric. *Mekhela chadors*(Silk Sarees) and *Gamosa* (Towel) crafted from these indigenous materials have high demand in Assam and even across India. SUALKUCHI'S is the registered trademark of the industry displaying the authenticity of the products.

Out of the total 12 development blocks of Kamrup district, Sualkuchi block was purposively selected for the study. A list of villages comprising weavers' household were prepared and from that list four different villages were selected randomly for final sample collection. Further,25 numbers of weavers' household were selected randomly from each of the selected villages to make the sample size 100 and primary data were collected with the help of pre-tested schedule through personal interview. The collected data were further classified into four different size groups based on number of looms owned by the respondents viz., Group I (having 1 to 2 looms), Group II(having 3 to 4 looms), Group III (having 5 to 6 looms), Group IV (having 7 or more looms), respectively.

COST AND RETURN ANALYSIS

Cost Concept

The following are the various cost items included in the analysis:

1. Cost A_1 includes cost of hired human labour, cost of material inputs, electricity, interest on working capital, depreciation on implements and equipments, depreciation on infrastructure, land revenue and miscellaneous cost.
2. Cost B_1 was estimated by adding interest on fixed capital to Cost A_1.
3. Cost C_1 was calculated by adding the imputed value of family labour to Cost B_1.
4. Cost C_3 = Cost A_1 + 10% of managerial cost
5. **Variable cost:** Variable cost includes cost of human labour, cost of material inputs, electricity, miscellaneous cost and interest on working capital.

6. **Fixed cost:** Fixed cost includes depreciation on implements and equipments, depreciation on infrastructure, land revenue and interest rate on fixed capital.
7. **Total cost:** Total cost was calculated by adding both variable cost and fixed cost.

Return Concepts

Various concepts of returns were considered for the goal of evaluating the income from weaving such as:

1. **Gross income:** Gross income was calculated by the total value of returns received by the weavers per loom per year
2. Farm business income = Gross income – Cost A_1
3. Farm business income = Gross income – Cost B_1
4. Net income = Gross return – Cost C_1
5. Net income over variable cost = Gross income- Variable cost
6. Net income over total cost = Gross income- Total cost
7. Return to management = Gross income – Cost C_3
8. Benefit cost ratio (BCR) based on variable cost = Gross return / Variable cost
9. Benefit cost ratio (BCR) based on total cost = Gross income/ Total cost

RESULTS AND DISCUSSION

(I) Cost of silk weaving across different size groups of weavers

Overall average variable cost per loom, (as shown by Table 1) was found to be ₹ 36458.60. Among the variable inputs, cost of yarn accounted for 58.47 per cent of the total variable cost followed by the cost of labour (32.58 per cent), miscellaneous cost (1.32 per cent), cost of electricity (0.92 per cent) and cost of dye (0.88 per cent), respectively. The average variable cost per loom was found to be ₹ 35592.53 for Group I, ₹ 36267.92 for Group II, ₹ 36578.41 for Group III and ₹ 37395.64 for Group IV. In case of silk weaving, yarn was found to be the most important variable input contributing 58.47 per cent to the total variable cost per loom amounting to ₹ 21300. The cost of yarn ranged from ₹ 22000 in Group I to ₹ 20250 in Group IV.

Table 2 reveals that an average fixed cost per loom for the entire sample was ₹ 4555.17 and it varied from ₹ 4674.21 in Group I to ₹ 4470.40 in Group IV. Among the various components of fixed cost, contribution of interest on working capital was highest (58.97 percent) followed by depreciation on implements and equipment (35.10 percent). However, the contribution of depreciation on infrastructure as well as land revenue to total cost was very negligible accounting about 5.87 percent and 0.06 percent respectively.

Table 1: Total variable cost of weaving for different size groups (₹ Per loam per year)

Particulars/Size	Group I	Group II	Group III	Group IV	Overall average
(A) Cost of materials					
i) Cost of yarn	22000.00 (61.81)	21750.00 (59.97)	21200.00 (57.96)	20250.00 (54.15)	21300.00 (58.47)
ii) Cost of dye	363.33 (1.20)	347.50 (0.96)	286.26 (0.78)	280.02 (0.75)	319.27 (0.88)
iii) Cost of electricity	370.43 (1.04)	372.50 (1.03)	306.67 (0.84)	282.56 (0.76)	333.04 (0.92)
iv) Miscellaneous cost	464.00 (1.19)	482.50 (1.33)	506.00 (1.43)	510.33 (1.68)	480.70 (1.32)
v) Total cost of materials	23197.76 (65.24)	22952.50 (63.29)	22298.93 (61.01)	21322.91 (57.34)	22433.01 (61.59)
(B) Cost of labour					
i) Family labor	7420.00 (20.84)	5137.50 (14.17)	4850.00 (13.26)	3733.33 (9.98)	5285.21 (14.50)
ii) Hired labour	3000.00 (8.44)	6125.00 (16.88)	7250.00 (19.82)	10200.00 (27.28)	6643.75 (18.08)
iii) Total cost of labour	10420.00 (29.28)	11262.50 (31.05)	12100.00 (33.08)	13933.33 (37.26)	11929.96 (32.58)
(C) Interest on working capital	2014.67 (5.66)	2052.90 (5.66)	2070.47 (5.66)	2116.73 (5.66)	2063.77 (5.66)
(D) Total variable cost	35592.53 (100.00)	36267.92 (100.00)	36578.41 (100.00)	37395.64 (100.00)	36458.60 (100.00)

**Figures within parentheses indicate percentages to total variable cost.*

Table 2: Total fixed cost of silk weaving incurred by different size groups (₹ Per loam per year)

Particulars/Size	Group I	Group II	Group III	Group IV	Overall average
A. Depreciation on implements and equipments	1625.50 (35.76)	1608.33 (35.31)	1598.95 (34.95)	1562.50 (34.76)	1598.69 (35.10)
B. Depreciation on infrastructure	289.41 (6.19)	268.33 (6.00)	259.16 (5.71)	252.50 (5.56)	267.35 (5.87)
C. Land revenue	3.00 (0.06)	3.00 (0.06)	3.00 (0.06)	3.00 (0.06)	3.00 (0.06)
D. Interest on fixed capital	2756.80 (58.98)	2675.70 (58.97)	2675.60 (58.97)	2636.40 (58.94)	2686.13 (58.97)
E. Total fixed cost	4674.21 (100.00)	4539.63 (100.00)	4536.81 (100.00)	4470.40 (100.00)	4555.17 (100.00)

**Figures within parentheses indicate percentages to total fixed cost.*

Table 3: Total cost of silk weaving by different size groups (₹ Per loam per year)

Particulars/Size	Group I	Group II	Group III	Group IV	Overall average
A. Total variable cost	35592.53 (88.69)	36267.90 (88.88)	36578.41 (88.89)	37395.64 (89.11)	36458.60 (88.89)
B. Total fixed cost	4674.21 (11.31)	4539.63 (11.12)	4536.81 (11.11)	4470.40 (10.89)	4555.17 (11.11)
Total cost (A+B)	40266.74 (100.00)	40807.53 (100.00)	41115.22 (100.00)	41866.04 (100.00)	41013.79 (100.00)

**Figures within parentheses indicate percentages to total cost.*

Table 4: Cost of weaving per loom according to various size groups (₹ Per loam per year)

Items	Group I	Group II	Group III	Group IV	Overall average
Cost A_1	30036.36	32991.51	33562.24	35579.72	33042.45
Cost B_1	32711.96	35667.21	36198.64	38336.52	35728.58
Cost C_1	40131.96	40804.71	41048.64	42069.85	41013.79
Cost C_3	44145.16	44885.18	45153.5	46276.84	45115.17

Table 3 showed the size group wise total cost per loom as well as overall average cost per loom for the entire sample. On an average total cost per loom was estimated to be ₹ 41013.79 for all the samples. However, it varied from ₹ 40266.74 in Group I to ₹ 41865.64 in Group IV. The table also reveals that the contribution of variable cost to the total cost was very high (88.89 per cent) as compared to contribution of fixed cost in the total cost which accounted for 11.11 per cent only.

Table 4 reveals the cost of weaving for the different size groups of weavers, such as Cost A_1, Cost B_1, Cost C_1 and Cost C_3. It is observed from the table that Cost A_1 per loom for the entire sample was ₹ 33042.45, however across the different size groups cost A_1 per loom was found highest for Group IV (₹ 35579.72) and lowest for Group I (₹ 30036.36). Among all the items of Cost A_1, the highest amount was incurred for yarn followed by hired labour. Overall Cost B_1 was found to be ₹ 35728.58 per loom. Average Cost C_1 per loom was found to be ₹ 41013.79 while Cost C_3 was estimated to be ₹ 45115.17 per loom. Among the various size groups, Cost C_3 was found to be highest for Group IV (₹ 46276.84 per loom) and lowest for Group 1 (₹ 44145.16 per loom). The analysis reveals that the cost per loom increased with the increase in loom size (no. of loom). However, Gogoi (2003) observed an opposite trend for total variable cost per loom as well as total cost per loom.

(II) Returns from silk weaving

Table 5 reveals annual return per loom for different size groups. Gross income per loom for entire sample group was found to be ₹ 68376.91. Thegross income per loom was calculated to be ₹ 64660.45 for Group I, ₹ 66950.00 for Group II, ₹ 69696.41 for Group III and ₹ 72200.77 for Group IV. Nagaraju and Rao (2014) from their study also reported that the annual income of handloom weavers ranged between ₹ 25,000 and ₹ 75,000 in the state of Andhra Pradesh.

It is revealed from the table that gross income shows an increasing trend with the increase of loom size.

Table 5: Income from silk weaving per year per loom for various size groups of weavers' households (₹)

Particulars	Size groups				
	Group I	Group II	Group III	Group IV	Overall average
(a) Gross income	64660.45	66950.00	69696.41	72200.77	68376.91
(b) Net income	24528.49	26145.29	28647.77	30130.92	27363.12
(i) Net income over variable cost	29067.92	30682.10	33118.00	34805.13	31918.29
(ii) Net income over total cost	24393.71	26142.47	28578.19	30335.13	27362.38
(c) Firm business income	34624.09	33958.49	36134.17	36621.05	35334.45
(d) Firm labour income	31948.49	31282.79	33497.77	33864.25	32648.33
(e) Return to management	42454.84	44064.82	49496.50	55256.16	47818.08
(f) Benefit cost ratio based on variable cost	1.82	1.85	1.91	1.93	1.87
(g) Benefit cost ratio based on total cost	1.61	1.64	1.70	1.72	1.67

The overall net income for the sample household was ₹ 27363.12 per loom. Net income was found to be highest in Group IV and lowest in Group I. Both the net income over variable cost and net income over total cost were seen to have increased with the increase in loom size. Average firm business income was found to be ₹ 35334.45. Firm business income was recorded to be ₹ 34624.09 for Group I, ₹ 33958.49 for Group II, ₹ 36134.17 for Group III and ₹ 36621.05 for Group IV. Firm labour income for the entire sample was calculated to be ₹ 32648.33 on an average. Firm labour income was found to be ₹ 31948.49 for Group I, ₹ 31282.79 for Group II, ₹ 33497.77 for Group III and ₹ 33864.25 for Group IV. The average net income and family labour income per loam were found be much higher in contrast to the results observed for handloom weavers of Warangal district of Telangana by Sadanandam (2016). Return to management per loom for the entire sample was estimated at ₹ 47818.08. The table also reveals that the return to management was found to be highest in Group IV and lowest in Group I. However, a negative relationship of different incomes of handloom weavers per loom with the loom size groups was reported by Gogoi (2003) and Gogoi *et al*.(2005).

CONCLUSION AND POLICY

From the study it can be concluded that silk weaving was highly cost and labor-intensive enterprise. Out of the total cost, the highest cost was incurred for yarn and dye. The total annual cost and gross income per loom was ₹ 41013.79 and ₹ 68376.91; respectively. From the study, it can be suggested that weaving, despite being a high valued enterprise, there is a need to provide cheap and adequate credit to weavers for covering both variable as well as investment cost for installation of loom in order to make it more profitable. Further, weavers should be organized into groups in order to reduce the transportation cost as well as the input cost. Adequate assistance for modernization of traditional looms with updated technology along with proper financial support from the government would be helpful for the weavers in order to increase the production.

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