J Bangladesh Agril Univ 20(4): 433-440, 2022 https://doi.org/10.5455/JBAU.129305

ISSN 1810-3030 (Print) 2408-8684 (Online)

Journal of Bangladesh Agricultural University

Journal home page: http://baures.bau.edu.bd/jbau

Research Article

Insights of Handloom Producers of Sirajganj District in Bangladesh

Atikul Islam[1], Sadika Haque[1]✉, Mst. Tania Parvin[2], Nafisa Zaman[1], Shahnaz Begum Nazu[3], Md. Salman[1] and Md. Emran Hossain[4]

[1]Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh
[2]Department of Agribusiness, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur-1706, Bangladesh
[3]Khalilganj School & College, Kurigram Sadar, Kurigram, Bangladesh
[4]Department of Agricultural Finance and Banking, Bangladesh Agricultural University, Mymensingh, 2202, Bangladesh

ARTICLE INFO

Article history
Received: 12 Nov 2022
Accepted: 06 Dec 2022
Published: 31 Dec 2022

Keywords
Handloom weavers,
Gini coefficient,
Profitability,
Bangladesh

Correspondence
Sadika Haque
✉: sadikahaque@bau.edu.bd

ABSTRACT

This study was undertaken to measure the current socioeconomic and profitability status of the traditional handloom producers living in Sirajganj district of Bangladesh. Primary data were collected from 60 randomly selected handloom owners. Two main products were considered in this study, i.e., *sharee*[1] and *gamcha*[2]. Descriptive statistics and cost-return analysis were performed to assess the present situation and profitability of handloom production. The Gini Coefficient and Lorenz Curve measured inequality among respondents. A log transformed multiple linear regression model was applied to explore the factors influencing handloom products production. Results revealed that most of the handloom weaving was financed through the weavers' own capital and taking loans from the bank. The undiscounted benefit-cost ratios were 1.12 and 1.20 for *sharee* and *gamcha*, respectively, indicating both enterprises were profitable but *gamcha* was more profitable than *sharee*. The Gini Coefficient of handloom weavers' income is less than 0.25. Results from the regression analysis revealed that human labour, yarn, color, and processing cost significantly impacted *sharee* and *gamcha* production. Therefore, efficient utilization of these resources in the production process of handloom products would be essential that can bring more profit for handloom production.

Introduction

The Handloom industry is known as one of the biggest and most vital as well as ancient cottage industry after the agriculture sector of Bangladesh (Jafar et al., 2019; Rahman, 2013), but weaving is considered an ancient and one of the most vulnerable occupations. With a significant number of handloom operating units, the industry supplies around 86.9 million yards of fabrics of different kinds in each month (BHB, 2018; Islam et al., 2013; Islam & Hossain, 2015). It constitutes 48.04% of total employment in the cottage industry and 49.46% of the total production (Islam & Hossain, 2015). Besides, contributing to the generation of rural employment and income, it also alleviates rural poverty, substituting imports, and increases potential for exports (Khairul and Elias, 2012). On the other hand, agricultural production which is not always sustainably supply the income sources for rural peoples' livelihood (Tasnim, 2020), handloom industry play a significant role here by providing the second largest source of income after agriculture (Ahmed et al., 2022).

Although in the early 17th century, the handloom sector of the Indian sub-continent and more particularly Bangladesh region gained a high degree of efficiency for producing quality products (BHB, 2012), but is a declining trend in the last 15 years (BHB, 2018).

[1] This is the traditional cloth of women in Bangladesh. This is a lengthy piece of fabric that is two to four feet wide and five to nine yards long. Usually, women tie one end around their waist and throw the other over their shoulder.

Cite This Article
Islam, A., Haque, S., Parvin, M.T., Zaman. N., Nazu, S.B., Salman, M. and Hossain, M.E. 2022. Insights of Handloom Producers of Sirajganj District in Bangladesh. *Journal of Bangladesh Agricultural University*, 20(4): 433-440. https://doi.org/10.5455/JBAU.129305

[1] Gamcha is a traditional, lightweight, scratchy cotton towel used in Bangladesh and India for wiping perspiration or drying the body after bathing. A sweat cloth is known locally as a gamcha.

According to Shafinaz et al. (2014), Bangladesh's weavers have the best technical competence in the world (i.e., Dhaka muslin products, the finest cotton fabric). However, the production and processing of handloom products depend on its ability to make a profit. Handloom owners can secure higher profits by increasing sales revenue, labor, capital and yarn inputs (Islam and Hossain, 2018). Similar result was also evidenced by Islam et al. (2013). Some studies evidenced that this industry is no more profitable now (Islam & Hossain, 2018). Due to a number of factors including lack of education and skill of the workers, absence of organization of the weavers, lack of government patronage, high cost of raw materials especially yarn, lack of organizing capability, inadequate technology & efficiency, lack of policy support, great knowledge gap, lack of power supply and shortage of working capital and credit facilities and smuggling of clothes from other countries - are the main forces that directly hit the handloom industry (Hossain, 2015; Khairul and Elias, 2015). On the other hand, the power loom also takes place of the handloom gradually (Sing and Banasal, 2011). In Sirajganj, handloom textiles are operated as family businesses where all adult family members participate in one handloom activity. The factories remain operative for nearly 8 months a year and remain suspended for different climatic reasons like heavy rain, damp weather and inundation of flood in the rainy season, low sunlight and foggy weather in the winter season (Jafar et al., 2019).

The corpus of prior knowledge demonstrates the industry's importance, profitability, affecting variables, trends, etc., yet there is still a gap. Why handloom production is showing a declining trend, what are the driving factors of the industry, and how the lifestyle of the owners of the handloom is changing are overlooked in the literature. As the sector is important from a different aspect, root level knowledge like the socio-economic status of the handloom owners, current cost-benefit and profitability analysis, determinants of the products etc. are very important to protect the industry from decline. Such groundbreaking knowledge will also assist to formulate policy in future intervention or development. Therefore, it is essential to investigate the current status of handloom owners, and profitability of handloom production and determination of the factors which are truly responsible for increasing or decreasing profitability of this industry. The study will try to uncover the underlying reason also and shades light on the above-mentioned context.

Study area and Methodology

Study area

The study was conducted in Sirajganj district of Bangladesh, a flood-affected and poverty prone district situated at the Jamuna River bank which is the most unpredictable river basin of Bangladesh, indicating climate vulnerability. The district is famous for handloom textile factories for a long in the past (Jafar et al., 2019). We have selected three Upazilas (sub-administrative areas) from this district such as Sirajganj Sadar, Belkuchi, and Shahjadpur where the handloom industry has flourished with a high concentration of handloom owners and workers. Data were collected during February-March 2018 from a sample of 60 handloom owners through face-to-face interviews and personal observation, who are selected randomly. Among the selected respondents, equal respondents were well considered for the two handloom products i.e., *Sharee* and *Gamcha*. In depth interviews were also conducted with 10 experienced, aged owners and workers. Socio-demographic and economic variables like age, educational status, family size, occupation, source of finance, types of looms, etc. were analyzed using descriptive statistics such as frequencies, percentages, mean, and standard deviation wherever applicable. Descriptive statistics were also used to analyze various distributions related to producers. The tabular analysis included socioeconomic characteristics of sample respondents, costs and return, input use, problems faced by the respondents and their probable suggestions. In order to estimate the effects of key variables on handloom production, the Cobb-Douglas form of production function was used in the study.

Profitability of handloom production

Per year profitability of handloom production from the view point of individual owners was measured in terms of gross return, gross margin, net return and benefit cost ratio (undiscounted). The following equation was used to estimate gross return (Dillon and Hardaker, 1993):

$$GR_i = \sum_{i-1}^{n} Q_i \, P_i \text{.....} (1)$$

Where, GR_i= Gross return from ith product in Bangladeshi Taka (BDT/piece); Q_i = Quantity of the ith product (Piece of *Sharee/Gamcha*); P_i = Average price of the ith product (BDT); i = 1, 2, 3, ..., n (no. of handloom owners).

Interest on operating capital (IOC) was estimated by using the following formula:

$$IOC = Al \times i \times t \text{.....} (2)$$

$$Al = \frac{Total\ investment}{2} \text{.....} (3)$$

Where, i = Rate of interest per year (%); and t = Period of production (in month).

The following equation used to assess gross margin:
GM = TR – TVC …… (4)
Where, GM = Gross Margin; TR = Total Return; and TVC = Total Variable Cost.

To determine the net return of *Sharee/ Gamcha* production, the following equation was used in the present study:
$\Pi = \Sigma P_m.Q_m - \Sigma (Px_i.X_i) - TFC$……(5)
Where, Π = Net return (BDT/piece); P_m = Per unit price of produce (BDT/piece); Q_m= Quantity of the production per factory (Piece); Px_i= Per unit price of ith inputs (BDT.); X_i = Quantity of the ith inputs per factory (Piece); TFC = Total fixed cost (BDT); and i = 1, 2, 3, ..., n (number of inputs). The formula of calculating BCR (undiscounted) is shown below:

$$\textit{Benefit Cost Ratio} = \frac{Total\ benefit}{Total\ cost} \ldots\ldots\ldots\ldots\ldots\ldots(6)$$

Functional analysis of factors influencing handloom production

Cobb-Douglas type production function has been used to identify the factors influencing handloom production. By taking log in both sides, the Cobb-Douglas production function was transformed into the following form because it could be solved by the ordinary least squares (OLS) method:

$\ln Y_i = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + \mu_i$ …… (7)
Where; Y_i = Gross return (BDT/year), ln a (natural logarithm) = constant or intercept of the function, X_1= Human labor cost (BDT/year); X_2= Cost of yarn (BDT/year), X_3= Cost of coloring (BDT/year), X_4= Cost of processing (BDT/year), X_5 = Cost of electricity (BDT/year); X_6= Cost of repairing (BDT/year), X_7= Cost of packaging (BDT/year), X_8 = Cost of transportation (BDT/year), b_1,b_2 ….., b_8 = Coefficient of respective variables; ln = natural logarithm; i= 1, 2, 3 ,….., n; μ_i = Error term.

Results and Discussion

Socioeconomic profile of the Handloom owners

The study found that 65% of handloom owners were aged between 41-50 years and half of the handloom owners had a primary level of education (Table 1). Parvin et al. (2020); and Parvin and Haque (2017) also found that the mean age of respondents was nearly 44 years, and even though all the handloom households have access to education, their level of education was very dissatisfactory (i.e., below primary school). Most of the families (70%) were single, handloom was the main occupation for most owners (65%), and only 10 percent of owners obtained capital from their funds. The average land holding of the handloom owners were 0.52 ha and 0.41 ha who had agriculture as a secondary occupation and who did not take agriculture as their secondary occupation, respectively, which means, all the owners were marginal farmers. It could be mentioned here that in context of Bangladesh marginal farmers are the farmers who cultivate less than 1 acre of crop land. Figure 1 represents that most of the handloom owners spent more time with handloom activities than agriculture except the age group of 31-35 years. Besides, Table 2 also presents the cumulative percentage of income earned by the handloom owners with two situations i.e., handloom with agriculture practice and handloom without agriculture practice in different quantiles.

Table 1. Socio-economic characteristics of the handloom owners

Variables	Categories	Percentage	Area
Age group (year)			
	31-35	10%	
	36-40	15%	
	41-45	40%	
	46-50	25%	
	51-55	5%	
	56-60 & above	5%	
Level of education			
	Primary	50%	
	Secondary	30%	
	Higher secondary	15%	
	Graduate and above	5%	
Types of occupation			
	Handloom Only	65%	
	Handloom with agriculture	20%	
	Handloom with business	10%	
	Handloom with service	5%	
Source of finance			
	Own + bank	50%	
	Own + NGO	40%	
	Own capital	10%	
Types of family			
	Single	70%	
	Joint	30%	
Land ownership (ha)			
	handloom with agriculture		0.52
	handloom without agriculture		0.41

Source: Field Survey, 2018

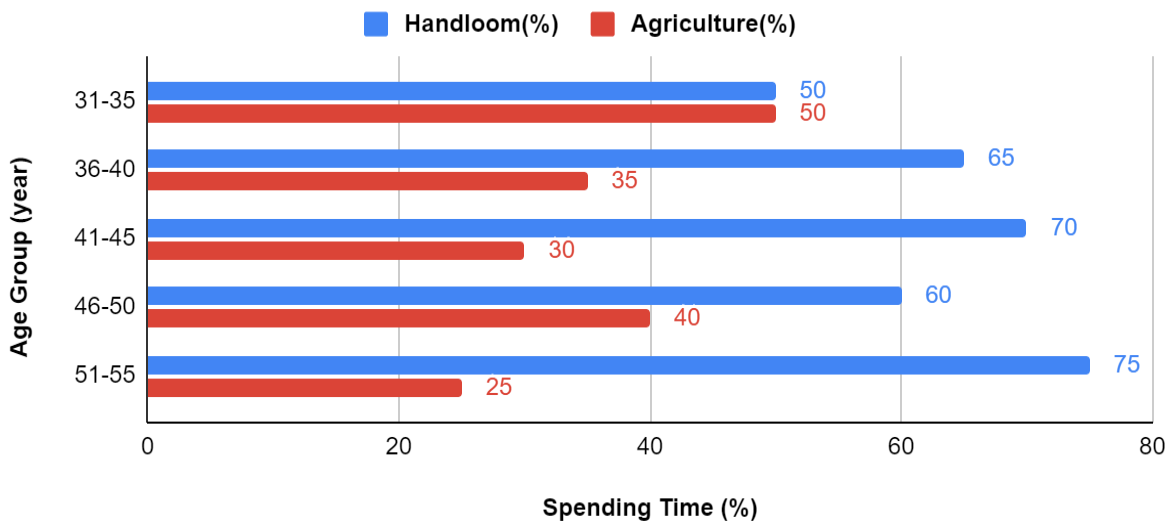

Figure 1. Time spent on handloom and agriculture by age

Table 2. Income earned by the respondents from handloom with agriculture practice and without agriculture practice

Quintiles	Cumulative % of Income		Line of Perfect Equality	
	Handloom with agriculture practice	Handloom without agriculture practice	Handloom with agriculture practice	Handloom without agriculture practice
0	0	0	0	0
0.25	0.15	0.15	0.25	0.25
0.5	0.34	0.34	0.5	0.5
0.75	0.59	0.59	0.75	0.75
1	1	1	1	1

In addition, this study also explores the income inequality among the handloom owners. Formula of area under Lorenz curve [½ (b1+b2) × 0.2] was used to measure the total area for the owners of handloom with agriculture as: [½× (0+0.15) × 0.25] + [½× (0.15+0.34) × 0.25] + [½× (0.34+0.59) × 0.2] + [½× (0.59+1) × 0.25] = 0.02+0.06+0.12+0.20 = 0.39

The Gini Coefficient was found by taking the ratio of the area between the line of perfect equality and the Lorenz Curve to the area under the line of perfect equality. The area between the line of perfect equality and the Lorenz curve here is = 0.5 - 0.39 = 0.11. That is: 0.11/0.5 = 0.21, the Gini Coefficient of owner's (handloom with agriculture) income is 0.21 which interprets that all earn nearly equal income by operating this industry. Figure 2 shows the graphical presentation of the Lorenz curve.

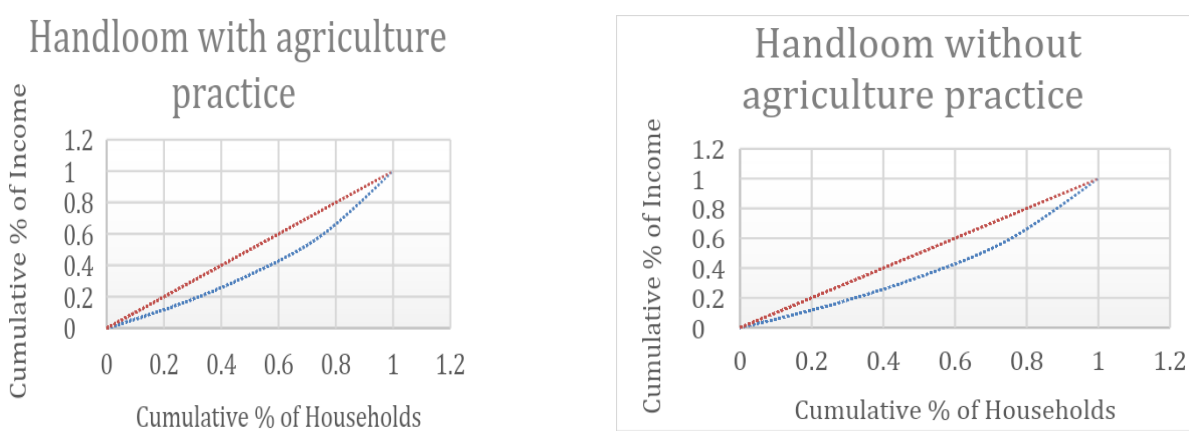

Figure 2. Lorenz Curve for handloom owners with agriculture practice and without agriculture

By using the same formula total area for the owners of handloom without agriculture under Lorenz curve was measured as: [½× (0+0.15) × 0.25] + [½× (0.15+0.34) × 0.25] + [½× (0.34+0.59) × 0.25] + [½× (0.59+1) × 0.25] = 0.01+0.05+0.11+.020 = 0.38

The area between the line of perfect equality and the Lorenz curve here is = 0.5 - 0.38 = 0.12. The Gini Coefficient of the owner's (handloom without agriculture) income is [0.12/0.5 = 0.24], which interprets that all earn nearly equal income. From the Gini Coefficient and Lorenz Curve result for both cases (with and without agriculture), income levels of all handloom owners are almost the same. However, the average income (BDT 45000 per month) and expenditure (BDT 36000 per month) of handloom producers with agriculture were more than handloom producers without agriculture (average income was BDT 30000 and average expenditure was BDT 26000). As handlooms with agriculture get support from crop cultivation for food consumption, a higher portion was spent on non-food items (38%) and a lower portion on food items (32%) and durable items (30%) compared to handlooms without agriculture.

Cost-benefit analysis of handloom production

In handloom production, various input costs like, the cost of human labor, the cost of yarn, the cost of coloring, the cost of chemicals and miscellaneous costs, including transportation, and electricity bill have been considered variable costs. The average cost of human labor per year for handloom production of *sharee* and *gamcha* were BDT 88500 and BDT 95700 (Figure 3). However, in the study area, the daily wage rate was an average of BDT 300 per person-day depending on the season and availability of labor. Hence yarn is used in a large amount, and it found that per year average cost of yarn for *sharee* was BDT 287620, and for *gamcha*, it was BDT 190696 on average. Moreover, colors were used to make the yarn colorful and per year average cost for *sharee* and *gamcha* were BDT 31800, and BDT 24424, respectively; and the respective cost of processing of yarns were BDT 62640, and BDT 29630, respectively per year. The average electricity cost for the production of *sharee* was BDT 13240 and BDT 8590 for *gamcha*. The costs of machinery repair were BDT 8000 and BDT 7500 per year for *sharee* and for *gamcha*, respectively. They also have to bear the cost of packaging for *sharee* on an average BDT 5400 but *gamcha* is sold directly to *mohajan*[3] in local hats. Transportation cost was estimated on a scale of ups and down transport cost over a year. The yearly average cost of transportation of *sharee* and *gamcha* were BDT 7800 and BDT 8550. There are other miscellaneous cost items include purchase of wax, paper for rapping, purchase of *maku*, oil for machinery, tax for hat, interest for loan etc. which was BDT 7600 for *sharee* and was BDT 10348 for *gamcha*. Interest on operating cost which includes variable cost in the production of *sharee* and *gamcha* for a period of 12 months production period. Interest rate of 12% per annum for both products was considered for calculation. The average interest on operating cost for *sharee* and *gamcha* were BDT 30768 and BDT 22485, respectively. Summation of the costs of variable inputs made total variable costs for *sharee* was BDT 543488 which is greater than *gamcha* (BDT 397243).

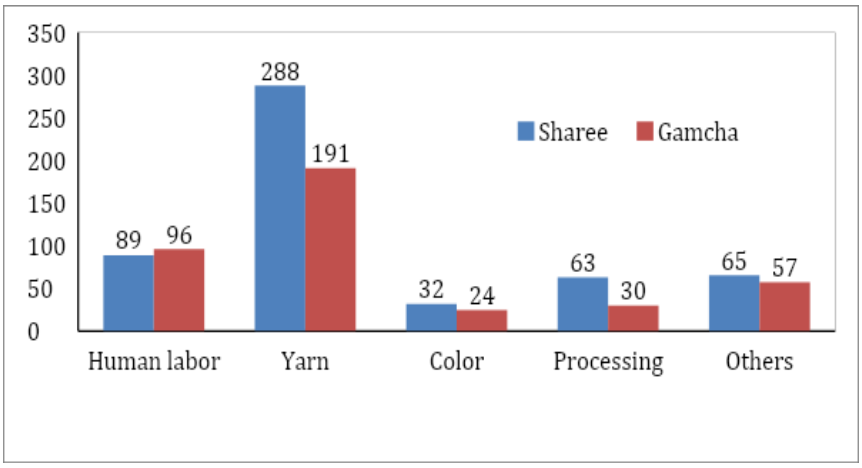

Figure 3. Variable costs for different items (in '000 BDT/year)

[3]Mahajan, a phrase from Sanskrit that means "a powerful man," However, legally it covers a trader, a dealer, and a moneylender in colonial Bengal. The phrase continues to have many different applications today. Mahajan has a relative connotation in the social and economic history

of Bengal. When compared to someone playing a supporting role in the process, the owner of the means of production and distribution is referred to as a mahajan.

On the other hand, the present study found that fixed cost of handloom production was more for *sharee* than *gamcha* where housing and machinery costs for *sharee* on an average were BDT 75167 and BDT 34833, respectively and for *gamcha* were BDT 72335 and BDT 28406, respectively. The respective per year average gross cost of handloom production for the products were BDT 653488 and BDT 497984; while per year gross returns from those handloom productions were BDT 736000 and BDT 600000, respectively. The mentioned BCRs (undiscounted) imply that Tk. 1.12 and Tk. 1.20 would be earned by investing every Tk. 1.00 in *sharee* and *gamcha* production respectively (Table 4), which also indicates that handloom production of *gamcha* is more profitable than *sharee* in the study area. Islam and Hossain (2018) discovered that the handloom owners' yearly average net profit was BDT 274.3 thousand, which is much higher than the results of our study. This discrepancy may occur as a result of the selection of handloom items, the region where they are produced, and the recent spike in the price of many items connected to handloom production. However, Liton and Hossain's (2019) study discovers that handloom weaving is still a slightly viable business in the Tangail district.

Table 4. Profitability of sample handloom producers (BDT/year for all produced items)

Particulars	*Sharee*	*Gamcha*
Quantity of product (No./year)	3200	5000
Unit price of the product (BDT)	230	120
A. Gross return (GR) (BDT)	736000	600000
B. Total variable cost (VC) (BDT)	543488	397243
Housing cost (BDT)	75166	72335
Machinery cost (BDT)	34833	28406
C. Total fixed cost (FC) (BDT)	110000	100741
Total gross cost (BDT) (B+C)	653488	497984
Gross margin (GR-VC) (BDT)	192512	202756
Net return (GR-TC) (BDT/year)	82512	102015
Net return (BDT/product)	25.79	20.40
Benefit Cost Ratio (GR/TC)	**1.12**	**1.20**

Factors affecting handloom production

This study also assessed the factors affecting the handloom production. In the context of production function analysis, as shown in Table 5, the Cobb-Douglas type production function model has been adopted to pinpoint and quantify the impacts of some variables on handloom production. It was found that the calculated regression coefficient of human labor cost for handloom production of *sharee* and *gamcha* was 0.495 and 0.658, respectively. Both were positive and significant at 5% probability level which can be stated that the use of additional labour would increase the gross return. Islam & Hossain (2018) also found a significant effect of labor for the profitability of handloom units. The coefficient of yarn cost for *sharee* (-0.236) and *gamcha* (-0.314) were negative and significant at 10%. It implies that a 1% increase in yarn cost, keeping other factors constant, would decrease gross return of both *sharee* and *gamcha* by 0.236% and 0.314%, respectively. However, Islam & Hossain (2018) found yarn as an important input for generating profit by the handloom units which would increase profitability by 0.221%.

The magnitude of the regression coefficient of coloring cost for *sharee* and *gamcha* was -0.358 and -0.234, respectively which were also negative and significant. This suggests that when color costs rise, gross returns fall because the majority of customers of handloom items are less interested in color than they are in quality. However, cost of processing influenced positively and significantly the gross return of both handloom products. Customers are very drawn to well-finished items and are prepared to pay extra for those that have attractive looks and are made with quality finishing. As a result, the processing expense has a favorable impact on the gross return. Moreover, holding other factors constant, 1% increase in repairing cost would significantly increase the gross returns by 0.285% for *gamcha* and 0.381% for *sharee*. Machine repair is included in the cost of repairing. If the respondents repaired their machines more promptly, they could create more output with the same equipment without incurring additional costs; as a result, the repairing costs increased the gross return. On the other hand, electricity cost, cost of packaging and cost of transportation were insignificant for production of *sharee* and *gamcha*.

Table 5. Factors affecting two handloom items production (Sharee and Gamcha)

Explanatory variables	*Sharee*		*Gamcha*	
	Coefficient	t-values	Coefficient	t-values
Intercept	2.247 (1.738)	1.344	1.875 (0.356)	2.372
Human labor cost (X_1)	0.495** (0.247)	2.094	0.658** (0.287)	2.331
Yarn cost (X_2)	-0.236* (0.094)	-1.824	-0.314* (0.169)	-1.885
Cost of coloring (X_3)	- 0.358* (0.143)	-1.718	-0.234* (0.215)	-1.731
Cost of processing (X_4)	0.268*** (0.164)	4.213	0.371*** (0.143)	4.247
Cost of electricity (X_5)	0.176 (0.271)	1.021	0.168 (0.192)	0.886
Cost of repairing (X_6)	0.381** (0.148)	2.135	0.285** (0.116)	2.120
Cost of packaging (X_7)	0.085 (0.125)	0.524	-	-
Cost of transportation (X_8)	0.116 (0.179)	0.874	0.174 (0.189)	0.458
R^2	0.762		0.841	
F-Value	71.23		78.28	
Return to Scale ($\sum b_i$)	0.927		1.10	

Note: ***, ** and * indicate significant at 1%, 5% and 10% percent level

It is evident from Table 5 that the value of the coefficient of multiple determinations (R^2) were 0.762 and 0.841. It indicates that about 76 percent and 84 percent of the variations of the gross returns from *sharee* and *gamcha* production have been explained by the explanatory variables included in the models. The summation of all the regression coefficients of the estimated model gives information about the returns to scale, that is, in response to output to an almost proportionate change in all inputs. Returns to scale for handloom production of *sharee* (0.92) is less than unity. It means the production function of *sharee* exhibited decreasing return to scale. However, the figure for *gamcha* was 1.10 which indicates that the production function exhibited increasing returns to scale. It means there is a scope to increase gross return by increasing inputs.

Conclusion and Policy Recommendations

Handloom industry is one of the biggest handicraft industries in Bangladesh. It generates remarkable benefits for the Bangladesh economy in terms of micro and macroeconomic impacts. It plays a vital role to reduce poverty, increase employment, and enhance household income and consumption for a portion of people of the country. Thus, in Bangladesh, the handloom sector has positive contribution to employment generation and economic growth. Therefore, to learn the exact socio-economic situation of handloom weavers, profitability of handloom production, and the determinants of profitability, research was done at Sirajganj District in Bangladesh. The study found that although both handloom enterprises were profitable, it was not satisfactory and had a scope to increase profitability if it can utilize human labor, yarn, coloring, processing cost efficiently. To operate the business effectively, handloom business requires cheap raw materials, adequate repairing facilities with reasonable cost, training on efficient level of input use and cost-effective production system to produce high quality products need to be ensured. Above all, the government must pay close attention to the industry in order to support it and restore its international reputation. As a result, the government and non-governmental organizations should offer financial, technical, and policy assistance for the growth of Bangladesh's handloom sector.

References

Ahmed, I., 2019. An Empirical Study on Continuation, Transformation and Transfiguration of Homestead Layout and Space Organization of Handloom Communities in Technical Papers. Architecture in a Changing Landscape, Forum 20(November), 153–164. https://www.researchgate.net/publication/337102215

Ahmed, Z., Hussain, A. H. M. B., Alam, R. and Singha, A. K. 2022. Perils and prospects of Manipuri handloom industries in Bangladesh: An ethnic community development perspective. *GeoJournal*, 87(3): 2125–2140. https://doi.org/10.1007/s10708-020-10365-3

BHB. 2012. 'Importance of Handlooms in Bangladesh', Article, Bangladesh Handloom Board, Bangladesh Handloom Board, Bangladesh Handloom Board, Dhaka. Bangladesh Handloom Board (2012). 'Profile', Report, Bangladesh Handloom Board Profile, BHB, BHB, Dhaka.

BHB. 2015. 'Annual Report, Bangladesh Handloom Board Profile, BHB, BHB, Dhaka.

BHB. 2018. Bangladesh Handloom Board. Monthly Management Information Report, 2018. Ministry of Textile. Government of the People's Republic of Bangladesh.

Dillon, J.L. and Hardaker, J.B. 1993. Farm management research for small farm development. Food and Agriculture Organization of the United Nations, Rome. (23) (PDF) Productivity and profitability of maize-pumpkin mix cropping in Chitwan, Nepal. Available from: https://www.researchgate.net/publication/297654682_Productivity_and_profitability_of_maize-pumpkin_mix_cropping_in_Chitwan_Nepal [accessed Dec 02 2020]

Islam, M.K. and Hossain, M.E. 2015. Determinants of technical inefficiency of handloom weaving industry in Kushtia district of Bangladesh: A Tobit model approach. *Journal of Investment and Management*, 4(4): 95-99.

Islam, M. K. and Hossain, M. E. 2018. Determinants of profitability of handloom weaving units operating in Kumarkhali Upazila of Kushtia District in Bangladesh. *International Journal of Research in Business Studies and Management*, 5(5): 1-7.

Islam, M. K., Hossain, M. E. and Ghosh, B. C. 2013. Cost-benefit analysis of handloom weaving industry in kumarkhali upazila of Kushtia District, Bangladesh. *Development Compilation*, 9(1): 63-72.

Khairul M. I. and Elias M. H. 2015. Determinants of Technical Inefficiency of Handloom Weaving Industry in Kushtia District of Bangladesh: A Tobit Model Approach. *Journal of Investment and Management*. 4 (4): 95-99. https://doi.org/10.11648/j.jim.20150404.11

Liton, M. R. I. and Hossain, E. 2019. Profitability analysis of handloom weaving units in Tangail district of Bangladesh. *Journal of Advanced Research in Humanities and Social Science*, 6(1): 7-15.

Parvin, M.T. and Haque, S. 2017. An analysis of socioeconomic indicators of rural non-agricultural households in Bangladesh: a case of handloom weaving. *Journal of Economics and Sustainable Development*, 8 (12): 1-12.

Parvin, M.T., Fatema, K. and Haque, S. 2020. Factors determining the credit accessibility by the small-scale entrepreneurs: a case of handloom weaving in Bangladesh. *International Journal of Business and Management*, 15 (8): 93-100.

Rahman, M.M. 2013. Prospects of handloom industries in Pabna, Bangladesh. *Global Journal of Management and Business Research*.

Shafinaz, L., Rokon A.A., Azim, A.Y.M., Chowdhuri, M., Hossain, M. A., Nur, G. and Saaqib, N. 2014. Loom and Power Loom. *American Journal of Engineering Research (AJER),* 3 (9):215-223.

Singh, K. and Bansal, M. 2011. A Review of Handloom Export Units in India, *Abhinav Journal*, 1 (11): 185-191

Tasnim, N. 2020. Profitability and Resource Use Efficiency of Handloom Weavers: A Study in Sirajganj District, Doctoral dissertation, DEPARTMENT OF DEVELOPMENT & POVERTY STUDIES, SHER-E-BANGLA AGRICULTURAL UNIVERSITY, DHAKA-1207)