

An In-depth Study on Handloom Saree and Saree Weavers: A Case Study of Kalihati Upazila in Tangail District

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Abstract: The handloom industry is one of the most ancient cottage and big industries in Bangladesh. Handloom weaving industry plays important role for determining rural employment and income. The aim of the study is to examine the present status of handloom saree weavers, to analyze the cost-benefit of handloom weavers, and to study the major challenges faced by this sector in Kalihati Upazila of Tangail District. The study is mainly based on primary data, although secondary data are also used. I have collected data from 91 handloom weaving units in the study area using a structured questionnaire. I have analyzed data through tabular, mathematical and statistical techniques. The study finds that Tangail District has 3,290 handloom weaving units with 25,500 handlooms. Weaving is a family based business activity. The study reveals that almost all weavers were literate and 60.44% of them completed primary education in the study area. Majority of the respondents (59.34%) said that their sources of finances were personal savings. Majority of the weavers (74.73%) were semi-skilled. Total cost for weaving business in the study area was 193,232,000 Tk. per year. Net return was 20,712,000 Tk. per year. Benefit-cost ratios was 1.11. The cost-benefit analysis approach helps researcher to assess that the weaving business is profitable. But recently the handloom sector in the study area faces various challenges. This study also provides some recommendations for improving the condition of handloom sector by using systematic and modern technology.

Keywords: Handloom, cost-benefit analysis, weaver socio-economic profile.

1. Introduction

Traditionally, handloom industry is one of the most important cottage industries in Bangladesh. Bangladesh is an agricultural developing-country in the world. Here unemployment is a serious problem. Handloom sector is an important source of employment for many rural and semi-urban people in the country. This sector contributes to the cloth production and export earnings of the country. The handloom industry is considered as the largest cottage

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industry in Bangladesh, as it provides employment for more than 3.16 lakh people (BBS, 2018). According to Bangladesh Labor Foundation, there are 1 million handloom weavers in Bangladesh (Promee et. al., 2021). In handloom sector, there are a large number of energetic entrepreneurs who have inner qualities of business leadership and hand workers.

Tangail district of Bangladesh has a long and prestigious history in producing handloom products. According to Nipa (2015), Tangail is the tenth largest clothes producing districts in Bangladesh. According to BBS (2013), this district produced more than 11% of total handloom products in Bangladesh. Handloom weavers of Tangail district produce Silk saree, Tangail Muslim and famous Jamdani saree, Benarasi saree, Katan saree and Tant saree, etc. These sarees are woven with various designs, colors and patterns. Each of them is produced in different forms and delivered patterns. Tangail sarees are traded throughout the country as well as exported to India, Nepal, Bhutan, Singapore, etc. The weavers also produce *Lungi*, Bedsheet, Wrapper, *Gamcha* and other products. These products are highly praised and admired throughout the world. In Tangail district, Tangail sadar Upazila and Kalihati Upazila are well known for Tangail saree. Kalihati is one of the famous Upazila for production of Tangail saree. The weavers of Kalihati Upazila sell their produced saree in temporary markets that sit only two days in a week in Bajitpur and Korotia. In these two days, traders come to these markets to purchase saree. A total of 510 handloom units are currently operating in Tangail (Numan, 2019).

The handloom industry has witnessed a drastic fall in recent years. In 1990, when the first census was conducted, the number of handlooms in Bangladesh was 212, 421; which declined to 1.16 lakh in 2003. During the same time, the number of workers also declined by 301,757 (133,444 male and 168,313 female) workers (BBS, 2018). Generally, socioeconomic status, occupational distribution, communication facilities as well as some other similar features have a sturdy impact on the expertise manpower and industrial development in this area. But these salient matters are almost neglected in recent research works. So the study is undertaken to investigate and find out the solutions of these problems of Tangail handloom saree weavers. The goal of the present study is to investigate the socio-economic status of the handloom saree-weavers, present the cost-benefit analysis, and the challenges of handloom saree-weaving.

1.1 Background information of the study

The handloom sector of Tangail district is famous all over the world for its exclusivity. Having special skills are the pre-requisite for the workers to fabricate and design Tangail saree. In Tangail district, the Basak community of Patrail Union is a special community of handloom weavers who are until now carrying on the genuine manufacturing process of Tangail handloom saree. Bazitpur and Korotia are the temporary markets to sell the saree of wavers that sit only two days in a week. Traders from various locations go to these markets and purchase their desired saree. There are various types of Tangail handloom saree: Cotton Saree, Cotton Jamdani Saree, Twisted Cotton saree, Half Silk Saree, Soft Silk Saree, Gas-mercerised saree, Dangoo saree, Baluchurri saree, etc. Mainly handloom industry is a cottage industry and in this industry most of the looms are put in house. In 1992, there were over 100,000 handlooms and 150,000 weavers in Tangail district located in Sadar, Basail, Nagarpur and Kalihati Upazilas. In 2008, there were 10,000 small and big handloom factories having 37,222 handlooms in several Upazilas of Tangail district where more than 70,000 weavers were working under the Basic Centres. According to a survey conducted in 2013, said there were 60,000 looms in Tangail. Of them, 8,305 were pit looms, 51,141 were Chittranjan looms, and 892 were power looms (BBS, 2013). Handloom sector produces 47.478 crore meters of cloths according to handloom census 2018 which fills up the countries 28% cloth demand (BBS, 2018). In national economy, the handloom sector contributed 2269.70 crore taka in VAT side. There were about 900,000 people employed in handloom sector (BBS, 2018). In consideration of overall employment of Bangladesh, the handloom sector holds the third position in case of employment generation after agriculture and garments sector. But handloom sector occupied second largest position for rural employment generation. Mainly for women self employment generation the contribution of handloom sector is outstanding. According to handloom census 2018, there were 290,282 handlooms in 116,117 handloom units and among those 191,723 were active and 98,559 handlooms were immobilized (BHB, 2021).

1.2 Types of handloom

There are two types of looms in Bangladesh: 1) handloom, and 2) power loom. Handloom is operated manually, which is associated with traditional manual machinery and modern mechanical power loom is operated by

power. In Bangladesh, there are several types of handlooms. They are: a) Pit loom, b) Power loom, c) Chittarranjan loom, d) Benarosi and Jamdani loom, e) Kama / Waist loom.

1.3 Operation procedures of handloom weaving

The operation procedure of handloom saree weaving includes the activities of dyers (scouring, dyeing, drying), the activities of designers (designing, jori threads) and the weavers activity (weaving). These are explained below:

1.3.1 Dyeing procedure

The yarn which is collected is white in color that is why dyeing activity is needed. Yarn is main raw materials and it is collected from the yarn seller. The white yarn which is collected from the yarn seller is different in quality based on price ranges. By the dyers the white yarn are colored according to the requirements. The dyeing process has a few steps such as:

Scouring: The first process of dying is scouring. In this process, any kind of dirt, waste or natural oils are removed from white yarn. The cleaning procedure is important because in clean yarn the dye can be set properly.

Dyeing: In dyeing step, the yarns are sunk into the dyes for a few hours so that the white yarn becomes colorful. The scenario is amazing when white yarn is turning into a colorful one.

1.3.2 Drying

After sunk into the dyes yarns are squeezed and fixed in a heavy bamboo stick. Then put the bamboo stick with colored yarn under the sun for drying. The sunlight makes yarn more lasting and colorful.

1.3.3 Designing

There are masters and workers in a designer house for designing the sarees. The master designer makes the design on a computer then prints it and gives it to the worker to work on it. The worker cut the specifically shaped paper in shape of printed design. Then the worker fit the specifically shaped paper into the handloom machine by using a scale and some tools made of metal. After that the workers join the paper one another for making a long chain of cut papers that consist of the whole design.

1.3.4 Weaving

The weavers have wooden handloom machines. After getting colored yarn and design, the weavers start working. The first work of weaving is to set the

threads and designs to the frames. This is very difficult work and it takes seven to fifteen days. Then using hand and foot weavers start weaving a saree. The weavers use their hands to pull and set thread and the presses to part of the loom. Most of the weavers weave 20-30 sarees in one design. After setting yarn and design, it takes usually 2 to 4 days to weave a single saree.

According to the local language, “Tana- Poren” is the wooden structure used by weavers for handloom weaving. The “Tana” is warp and “Poren” is the weft. The wooden structure also includes tools like "phaisel", "machine's bow", "narod", "nata", "Biswakarma fota", "maku", "sita/noli", "hatem", "moron", "fanel", etc. All these names are according to the local language of the weavers.

2. Literature review

Islam et al. (2013) contributed a study on “Cost-Benefit Analysis of Handloom Industry in Kumarkhali Upazila of Kushtia District, Bangladesh”. They showed that handloom industry plays significant contribution in the economy and livelihood of rural people in Bangladesh. They used primary data and pointed out that handloom weaving activity is profit-making and benefit is higher in the small and large scale units than the medium scale units. Because the medium scale industries do not get any facilities of cottage industry that get small scale industry and not get any facilities of scale effect that get large scale industry. Nipa et al. (2016) studied on “Socioeconomic status and problems of Tangail saree handloom weavers in Bangladesh”. They pointed out some problems in their study like inadequate credit facilities, high price of raw materials, low price of finished product, lack of proper technology, political viability, etc. To get rid of these identified problems, the respondents of the study suggested some positive steps from their own point of view. There are provision of institutional credit facilities, increased marketing facilities, communication facilities, and govt. intensive monitoring to control the market. Nipa et al. (2016) studied on “Effect of microcredit among handloom weavers of Tangail District in Bangladesh”. They found that the credit brought more or less positive impacts on some of socioeconomic variables among the borrowers. NGOs play a vital role to generate employment opportunity and increase income of the poor people by its credit program. Datta (2018) studied on “An in-depth study on Jamdani and Tangail weavers of Purba Bardhaman District, West Bengal, India”. He found that almost 15% of woven fabric is being produced in the country and further adding export revenue the sector makes a great contribution. Weaving

business is a family activity which engages the entire family in the process of making fabric. The strength of the handloom sector lies in its accessibility of workers, openness of innovation, uniqueness of finished goods, flexibility of production process, adaptability to the supplier's requirement and the inheriting wealth of its tradition. Promee et al. (2021) found that the total activities of raw material suppliers, designers, weavers, dyers, retailers and wholesalers were traditional handloom value chain operations. Paul (2019) conducted a study on "Analysis of Handloom Industry and Its Major Problems in Dakshin Dinajpur of West Bengal". He pointed out that there is a glorious history of handloom industry in West Bengal of India. This sector provides huge employment opportunity after agriculture because this is the highly labor intensive industry. The sector is famous enough for its versatility and uniqueness of production. But in recent days this "Green Industry" has been facing various constraints such as raw materials crisis, wage rate reduction, reduction in the experienced weaver, increasing competition with power loom, inadequate market facility etc. Islam & Hossain (2012) conducted a study on "An Analysis of Present Scenario of Handloom Weaving in Bangladesh". Their study found that handloom weaving sector is one the most earliest tent industries in Bangladesh and after agriculture this is the widest source of rural employment and income generations. They investigate the present structure of handloom industry of Bangladesh grounded on secondary data. They also pointed out that handloom industry provides employment opportunity in a secured family environment and by generating employment and income of the people, this industry contributes to reduce rural poverty, decrease import dependency, increase export potentials. Anumala (2021) conducted a study on "Examining the Relationship between Supply Chain Management Practices and Production Performance in Indian Handloom Industry". She found that cloth can be produced in three ways. Where production of cloth in the mill sector is an organized sector and the handloom sector and power loom sector are unorganized sectors. In case of supply chain management practices these sectors are not given any special attention. The study showed that production performances and supply chain management practices have a strong relationship. The supply chain management has a very important significance in this sector. Chowdhury (1990) studied on "On Cost-Benefit Analysis of Weaving by Handloom, Power-looms and Mills in Bangladesh, 1986/87". This study pointed out that without polyester suiting economically the handloom became the most significant of any alternative of weaving in all types of fabrics. Study showed that the return from cost-benefit analysis of

the handloom sector is the most efficient sector for weaving of fundamental dress of man and women. So, by raising indirect taxation on the power loom sector, excluding the handloom sector will be a great priority for emphasizing the handloom sector.

3. Methodology

For conducting this research work both primary and secondary data have been used. But this research work is mainly based on primary data. The primary data were collected from 6 villages in Kalihati Upazila of Tangail District, namely Balla, Birpakotia, Tanguria, Mamainnagor, Badda and Satihati, selected randomly for the study from the Upazila. The data were collected from the weavers through face-to-face interviews. A sample size of 91 respondents has been interviewed during April to May 2023. Secondary data has been collected from the Bangladesh Bureau of Statistics, relevant articles, reports, maps, journals, website, etc. I have used descriptive statistics to analyze the collected data, such as average, sum, percentage, gross return, net return, cost, and profitability of saree. In addition to these, I have also adopted multiple regression models and analyzed it by STATA Software.

3.1 Profitability analysis

To determine the profitability of handloom saree weaving in the study area net return analysis technique was used. I have calculated net return by deducting the total cost from gross return. To determine the net return of handloom saree weaving, I have used the following equation:

$$\Pi = \sum Pa \times Qa + \sum Pb \times Qb - \sum (PXi \times Xi) - TFC \dots\dots\dots (1)$$

Where,

Π = Net return of weaving business

P_a = Price of saree per piece

Q_a = Total quantity of saree

P_b = Price of other products per piece

Q_b = Total quantity of other products

P_{xi} = Price of i th input per unit used for saree weaving

X_i = Quantity of the i th input used for saree weaving

TFC = Total Fixed Cost

\sum = Sum = 1, 2, 3, n (numbers of input)

3.1.1 Benefit cost ratio (BCR)

BCR calculation is significant to depict the right path of economic and viable cash flow of a project. It helps decision makers to adopt appropriate investment policies, because higher the BCR indicates higher the profitability of an adopted project. To calculate benefit cost ratio the researcher has used following formula:

$$\text{Benefit Cost Ratio} = \text{Gross Benefit}/\text{Gross Cost}$$

Where,

Gross Benefit = Sales revenue of produced goods

Total cost = Total variable cost + Total fixed cost

3.1.2 Functional relationship

The researcher has used the following multiple functions to determine the major factors influence in gross return of handloom saree weaving:

$$Y = aX_1^{b_1}X_2^{b_2}X_3^{b_3}e^{U_i}.....(2)$$

This function was further transformed into the following logarithm form:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + U_i.....(3)$$

Where,

- Y = Gross return from handloom weaving
- a = Constant or intercept value
- X₁ = Cost of human labour (tk/piece)
- X₂ = Cost of yarn (tk/per unit)
- X₃ = Other input cost (tk/per unit)
- U_i = Stochastic disturbance term
- ln = Natural logarithm
- b₁, b₂, b₃ = Coefficient of respective variables.

4. Socio-economic status of handloom saree weavers based on field survey

Handloom industry is considered to be the biggest handicraft industry in Bangladesh. It is the largest non-farm economic activity in Bangladesh and an important source of rural employment after agriculture. In Bangladesh, the handloom industry of Tangail District is one of the oldest cottage industries and it has a long, prestigious and glorious history. Tangail is famous for the production of cotton sarees. By doing this business people reduce poverty, increase their employment opportunity and improve their socio-economic

condition. In Tangail District, the handloom weavers usually wove different types of handloom products. Such as: Tangail Muslin Silks saree, Jamdani saree, Half silk saree, Soft silk saree, Cotton Jamdani, Baluchurri saree etc. The demand for these saree is increasing day by day in different areas of Bangladesh as well as in abroad. There are many big markets in Tangail District where local traders usually trade these sarees. These markets are named as follows: Babur hat, Bazidpur hat, Bolla hat, Sohagpur hat, etc. Socio-economic statuses of handloom saree weavers based on field survey are explained below with the help of the various tables.

4.1 Age composition

From the field survey it was found that in the study area all the respondent age level was above 20 years. We know that young people are more energetic but middle and old age people are more experienced. Below table shows that 41-55 years age group was the largest number 64.84% among all the groups. This group is the most experienced and energetic group. So productivity and profitability is high of their group in weaving business. So government and other non-government agencies should come forward with financial and other supports for the development of this sector.

Table 1: Age compositions of the respondents

Age Groups	No. of respondents	Percentage
Below 20 years	0	0.00
20-40 Years	16	17.58
41-55 Years	59	64.84
Above 55 Years	16	17.58
Total	91	100

Source: Field Survey, 2023

4.2 Educational qualifications

The educational qualifications of the respondent weavers shown in the following table. Table shows that majority respondent weavers have primary education (60.44%) followed by secondary education (18.68%). There was almost no illiterate weaver. Respondent passing secondary level was 10.99%. Respondents who can sign their names constitute 9.89%. Our study shows that profit margin and quality level is high in literate weaver.

Table 2: Educational qualifications of handloom weavers

Education Level	No. of respondents	Percentage
Illiterate	0	0.00
Signature only	9	9.89
Primary Level	55	60.44
Secondary Level	17	18.68
Above Secondary Level	10	10.99
Total	91	100

Source: Field Survey, 2023

4.3 Marital status

Marital status is an important socio-economic indicator. Married people might be more active and available than unmarried people in weaving. Below table shows that 100% of the respondents were married.

Table 3: The marital status of the respondents

Marital Status	No. of respondents	Percentage
Married	91	100
Unmarried	0	0.00
Total	91	100

Source: Field Survey, 2023

4.4 Occupational distribution

The researcher found that weaving was the main occupation of the respondents. Along with weaving the people of the study area were involved in some other occupations such as farming, service, business etc. The respondents’ occupational distributions are shown in below table. It is drawn from the below table that handloom weaving was the main source of livelihood of majority (97.80%) respondents. Only 2.20% respondents’ main occupation was farming and business.

Table 4: The respondents’ occupational distributions

Occupation	No. of respondents	Percentage
Weaver	89	97.80
Farming	1	1.10
Service	0	0.00
Business	1	1.10
Total	91	100

Source: Field Survey, 2023

4.5 Yearly income

The below table shows that 15.38% respondents said that their family income is 10,000-50,000 Tk. 18.68% said their annual income is 51,000-100,000 Tk. and the majority 65.93% of the individual said that their annual income is above 1 lakh Tk.

Table 5: Yearly income of the respondents

Annual income (Tk.)	No. of respondents	Percentage
10,000-50,000	14	15.38
51,000-100,000	17	18.68
Above 100,000	60	65.93
Total	91	100

Source: Field Survey, 2023

4.6 Family size

Present study defined family as a group of humans living together under the restraint of one head and taking meals unified. The following table shows the family size of the respondent weavers. Survey data shows that only 2.20 % respondents belong to small family, majority (59.34%) respondents belong to medium family, and 38.46% belong to large family. We know that handloom weaving is family business, so it is helpful for business activity.

Table 6: The family members of the respondent weavers

Family size	No. of respondents	Percentage
Small Family (2-3 members)	2	2.20
Medium Family (4-6 members)	54	59.34
Large Family (7-above members)	35	38.46
Total	91	100

Source: Field Survey, 2023

4.7 Number of handloom weavers in the family

Most of the handloom weaving business is family based business. Family members and some other hired labors are employed in weaving business. The family members-involvement in handloom units is shown by the following table. The study shows majority (56.04%) respondents said that 1-2 family members were involved in their handloom weaving business, while 40.66% respondents said that 3-5 family members were involved in it.

Table 7: Involvement family members in handloom units

Particulars	No. of respondents	Percentage
1-2 members	51	56.04
3-5 members	37	40.66
Above 5 members	3	3.30
Total	91	100

Source: Field Survey, 2023

4.8 The materials of handloom weaving products

The most necessary raw materials for handloom weaving products are yarns. There are several types of yarn. The following table shows that 100% of the respondents reported cotton to be the raw material used for weaving saree in the study area.

Table 8: Types of yarn for handloom weaving products

Particulars	No. of respondents	Percentage
Cotton	91	100
Silk	0	0.00
Wool	0	0.00
Linen	0	0.00
Total	91	100

Source: Field Survey, 2023

4.9 Number of handloom in weaving units

Below table shows that majority (49.45%) of the weaver said that they had above 10 handlooms, 41.76 % had 6-10 handlooms and 8.79 % said that they had 1-5 handlooms in their weaving unit in the study area.

Table 9: The number of handlooms engaged in respondents' weaving units

Number of handloom	No. of respondents	Percentage
1 – 5	8	8.79
6-10	38	41.76
Above 10	45	49.45
Total	91	100

Source: Field Survey, 2023

4.10 Weaving experience of the respondents

Experienced weavers are more productive than less experience person. The level of waving experience of the respondents is shown in following table. Table shows that the majority (79.12%) respondents having experience 10-20 years while no one has 31 years above weaving experience.

Table 10: The level of weaving experience of the respondents

Experience (years)	No. of Respondents	Percentage
Below 10	12	13.19
10-20	72	79.12
21-30	7	7.69
31 and above	0	0.00
Total	91	100

Source: Field Survey, 2023

4.11 Skill of the respondent weavers

Skill weavers are more productive than unskilled weavers. Skill level of the respondent weavers is shown by below table. It was found that majority (74.73%) weavers were semi-skilled, only 5.49 % were technically skilled, and 19.78 % were non-skilled in weaving saree.

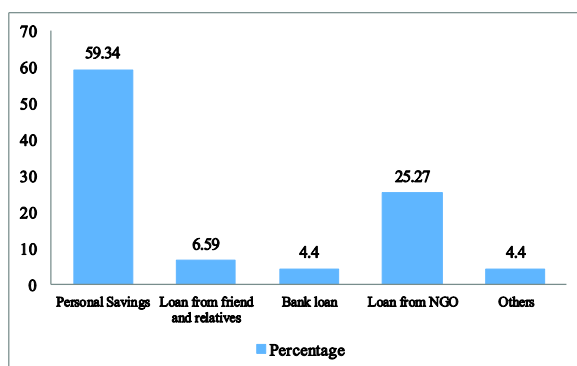
Table 11: Skill level of the respondent weavers

Skill	No. of respondents	Percentage
Technically skilled	5	5.49
Semi-skilled	68	74.73
Non-skilled	18	19.78
Total	91	100

Source: Field Survey, 2023

4.12 Sources of finance in weaving business

All the investment project need capital for initial investment. Financial sources found by the field survey are shown in below figure. The source of finance of 59.34 % weavers was personal savings. While 25.27% loan from NGOs, 6.59% loan from friends and relatives, 4.40% Bank loan and 4.40% from others sources.

**Figure 1:** Financial sources of the handloom weavers (Source: Field Survey, 2023)

4.13 Training status of the weavers

Training can increase human efficiency for improving more and quality production. The training status of the respondent weavers is shown in below table. Findings show that only 2.20% respondent weavers received training for weaving saree, and that majorities (97.80%) have no training for weaving.

Table 12: Training statuses of respondent weavers

Training Status	No. of respondents	Percentage
Yes	2	2.20
No	89	97.80
Total	91	100

Source: Field Survey, 2023

4.14 The buyers of weaving products

The buyer of the weaving products stated by the respondents is shown in below figure. Majority of the respondent (73.63%) said that the buyer of their product was whole seller and 26.37% said that the buyer of their product was retailer.

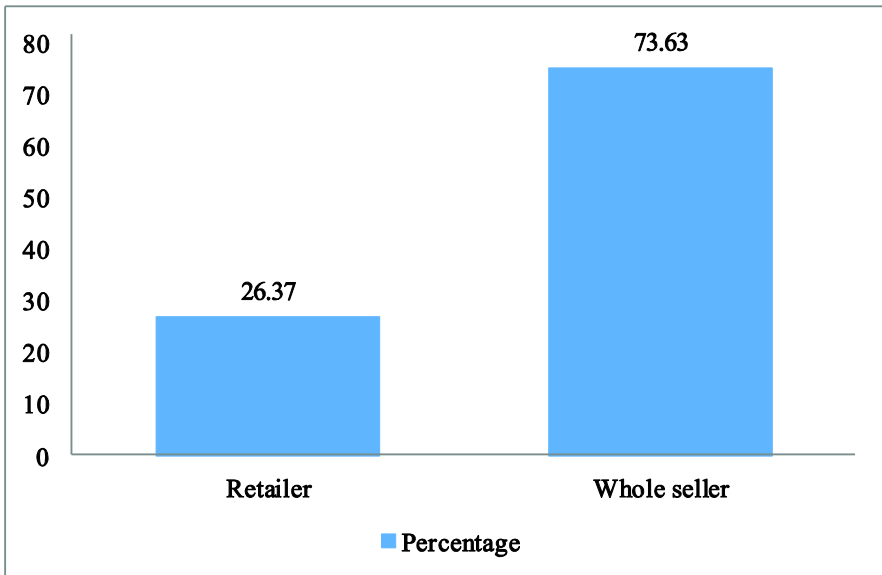


Figure 2: The buyers of the weaving products (Source: Field Survey, 2023)

4.15 Seasonality of weaving business

The survey finds that 100 % respondents involved in weaving activity said that the pick season of weaving business is two Eid festivals.

Table 13: Study areas, weaving-business pick season

Particulars	No. of respondents	Percentage
Pohela Boishak	0	0.00
Two Eid festivals	91	100
Puja	0	0.00
Others	0	0.00
Total	91	100

Source: Field Survey, 2023

4.16 Technology and equipments used

Technology and equipments that are newly invented can increase quantity and quality of handloom products. The use of newly invented technology and equipments in handloom saree weaving is shown by the following table. The below table based on field survey shows that 95.60 % respondents said that they did not use modern technology and equipment for saree production and only 4.40% respondents said that they used modern technology and equipment for saree production.

Table 14: Newly invented technology and equipment used in handloom saree weaving

Particulars	No. of respondents	Percentage
Yes	4	4.40
No	87	95.60
Total	91	100

Source: Field Survey, 2023

5. Cost and profitability analysis of handloom weaving product

The purpose of this section is to assess per year cost and returns of producing cloth. Cost and profitability analysis is the most important motive of private investment projects. Here cost of production involves human labor cost, yarn cost, and other input (rice powder, maize, starch etc) cost. These are variable costs. Two type of human labor are used- hired and family labor. The fixed cost is handloom and the cost of tools and equipment. The cost of these items was valued on the basis of market price. The return is also valued at market price. All cost items of handloom saree weaving in the study area are shown by the following table:

Table 15: Cost items of handloom weaving of the respondents

Particulars	Cost per year (Tk.)	Percentage of total cost
Details of variable cost		
Cost of labor	42,610,000	22.05
Cost of yarn	94,100,000	48.70
Other costs (rice powder, maize, kerosin, starch)	1,582,000	0.82
Total variable cost	138,292,000	71.57
Fixed cost items		
Handloom cost	16,010,000	8.28
Tools and equipment cost	38,930,000	20.15
Total fixed cost	54,940,000	28.43
Total cost (A+B)	193,232,000	100

Source: Field Survey, 2023

Cost

Total cost is the combination of all fixed cost and all variable costs. Here, respondents' total labor cost was 42,610,000 Tk., yarn cost was 94,100,000 Tk. and other input cost was 1,582,000 tk. So, total variable cost was 138,292,000 Tk. The handloom cost was 16,010,000 Tk. tools and equipments cost was 38,930,000 Tk. So, total fixed cost was 54,940,000 Tk. in the study area. Here total cost was 193,232,000 Tk.

Based on field survey, details of costs, returns and benefit cost ratio of weaving are shown by the following table:

Table 16: Detail of cost, return and benefit cost ratio of respondents

Details	Cost and return per years
(A) Gross cost	193,232,000
Details of return	
Sales revenue of saree	208,923,000
Sales revenue of other products	5,021,000
(B) Gross return	213,944,000
(C) Net return	20,712,000
(D) Benefit cost ratio	1.11

Source: Field Survey, 2023

Gross return

The gross return is calculated by the summation of total quantities of saree and other products multiplying with their price level in one year. The respondents' gross return from weaving business was 208,923,000 Tk and

other product was 5,021,000 Tk. per year. So the gross return was 213,944,000 Tk.

Net return

Net return is found by subtracting total cost from total return. In our study, net return was estimated to be 20,712,000 Tk. A Pie Chart on Total Cost, Gross Return and Net Return are as follows:

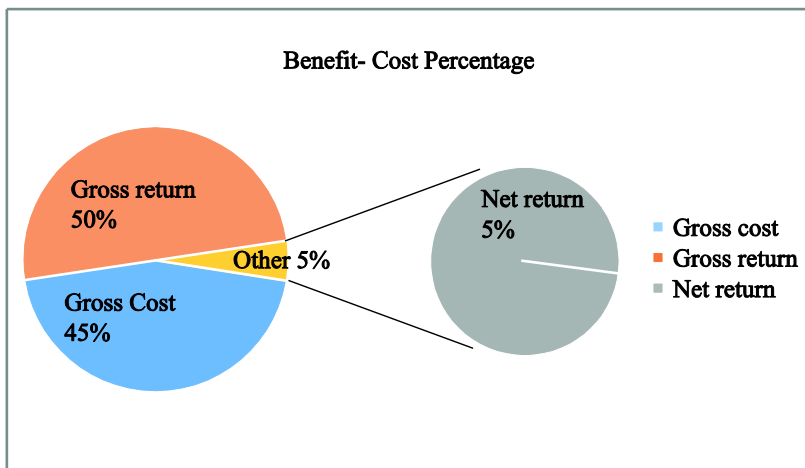


Figure 3: Pie chart on total cost, gross return and net return.

Based on the respondent weavers’ information of the study area, the above Pie Chart shows that the percentage of net returns in respect of gross cost and gross return. Here gross cost is 45 percent, gross return 50 percent, so the net return is 5 percent.

Functional relationship

The effect of an independent variable on a dependent variable is called functional relationship. If changes in the independent variable create changes in dependent variable then there is a functional relationship between the two variables. Handloom weaving saree production can be measured as a function of several variables. In the analysis of profitability, I have used three independent variables namely, labor cost, yarn cost and other cost (rice powder, maize, kerosin, starch) which have great impact on handloom saree production. I have used the following multiple function to determine the major factors influencing gross return of handloom saree weaving in this profitability analysis:

$$\ln Y = 2.622 + 0.325 \ln X_1 + 0.494 \ln X_2 + 0.102 \ln X_3$$

Following table shows the effects of independent variable on dependent variable in the study area based on researcher survey:

Table 17: Effects of independent variables on dependent variable

Explanatory Variable	Estimated Coefficient	Standard Error	t values	P> t	95% Confidence interval for B	
					Lower bound	Upper bound
(Constant)	2.622	0.534	4.91	0.000	1.560	3.683
Labor Cost (InX1)	0.325	0.050	6.45	0.000	0.225	0.425
Yarn Cost (InX2)	0.494	0.064	7.78	0.000	0.368	0.621
Other Cost(InX3)	0.102	0.050	2.02	0.046	0.002	0.202
R ²	0.8567					
Adjusted R ²	0.8518					
F Value	173.39					
Number of Observations	91					

Interpretation of input coefficients

- Labour cost (X₁): The regression co-efficient of labour cost was 0.325. It is significant and positive. One percent increase cost of labour, gross return would increase by 0.325 percent.
- Yarn cost (X₂): The co-efficient of yarn cost was 0.494, and it was also positive. One percent increase in cost of yarn, gross return would increase by 0.494 percent.
- Other cost (X₃): The co-efficient for other cost was 0.102. It is positive and significant. The value of coefficient indicates that keeping all other factors constant. One percent increase in other cost would increase gross return by 0.102 percent.

R² value

The co-efficient of determination, R² of the model were 0.86. It indicates that explanatory variables can explain the variations of gross return of the business by 86 percent in the model.

F value

The F value of the equation extracted for the functions were 173.39 which are highly significant. It specifies that all the describing variables were important for explaining the variations in gross return.

6. Changes in life style due to handloom saree production

One of the most important purposes of this study is to assess the weaver life style changes due to handloom saree production. The life style changes particulars are increased family income, increased family education, increased food and nutrition, increased medical facility, increased accommodation facilities, increased savings etc. Below table shows the result of life style changes occurred due to handloom saree production in selected variables in the study area. I have found that only 1.10% weavers' family income moderately changed, where 82.42% weavers' family income changed in small scale and 16.48% with no change. In case of respondents' family education, I have found only 1.10% respondents' family education were increased in a moderate scale, and 84.62% in small scale, and 14.29% respondents' family education with no change. In case food and nutrition, only 1.10% respondents were able to increase their food and nutrition in moderate scale, 80.22% in small scale, and 18.68% with no effect. According to the respondents, only 1.10% of them could increase their medical facility in a moderate scale and 79.12% in small scale where 10.78% with no change. Only 1.10% handloom saree weavers were able to increase their accommodation facilities moderately. While majority of the respondents (81.32%) could increase their accommodation facilities in small scale and 17.58% couldn't even achieve any positive change. Due to handloom saree production, only 1.10% respondents were able to increase their family savings in moderate scale and 68.13% in small scale, while 30.77% respondents couldn't even increase their saving. So, based on field survey the researcher found that socio-economic impact of handloom saree weaving was more or less satisfactory in the study area. The result of life style changes due to handloom saree production is shown by the following table:

Table 18: The result of handloom saree production on the life style of respondents

Particulars	Moderate Change	Percentage	Small change	Percentage	No Change	Percentage
Increased family income	1	1.10	75	82.42	15	16.48
Increased family education	1	1.10	77	84.62	13	14.28
Increased food and nutrition	1	1.10	73	80.22	17	18.68
Increased medical facility	1	1.10	72	79.12	18	19.78
Increased accommodation facilities	1	1.10	74	81.32	16	17.58
Increased savings	1	1.10	62	68.13	28	30.77

Source: Field Survey, 2023

7. Problems of Tangail handloom weaving

Handloom weaving business is a profitable non-farm business. It helps weavers to reduce poverty, unemployment and improve their socio-economic conditions. The weavers face some challenges. The weavers of the study area have little information about marketing of the handloom products. Because of lack of customer feedback, the weavers fail to percept the customer's choice to improve their product. The problems of Tangail saree weaving were classified into four general categories and they are explained below with following table:

Table 19: Problems of handloom saree weaving

Problems	No. of respondents	Percentages
Financial constraints	56	61.54
Technical constraints	33	36.26
Marketing constraints	2	2.20
Social constraints	0	0.00
Total	91	100

Source: Field Survey, 2023

7.1 Financial constraints

Financial constraints include the lack of credit facilities, lending from money leaders, lack of capital, high input price, high interest rate, low price of finished products etc. About 61.54% respondents said that they had financial problems. Some of these problems are explained below:

Lack of credit facilities

The traditional loom need adequate funds to buy basic material such as threads, yarn and color etc. For lack of adequate institutional credit facilities the weavers suffered from adequate credit crisis and they frequently cut out to produce saree in desired standard and amount in the expected time frame. Only 4.40% percent borrowers borrowed from Bank and 25.27% percent borrowed from various NGOs.

High input price

The most important raw materials for handloom saree weaving are yarn, rice powder, maize, karosin, starch, etc. In recent time high price of this raw materials has become a great threat to the weavers.

Low price of product

The respondent weavers claimed that the prices which they got for their woven saree and other products were not abundant enough to make adequate profit for them. Price of produced saree did not increase as increase in the production cost. As a result the weavers discouraged their new generation to continue their business.

7.2 Technical constraints

The technical constraints of handloom weaving sector constitute increasing use of power loom, lack of raw materials, time consuming work, etc. About 36.26% respondents said that they were suffering from some technical problems. Those are as follows:

Increasing power loom

Power loom is that where electricity is used to run machines instead of human labor. Most of the business owners are now interested to employ power loom for production. Increasing use of power loom increase production cost and increase unemployment problem.

Time consuming work

Handloom weaving required more time than power loom wearing. Buyers always want quick delivery for their order. But handloom is not quick as like as machines and power loom. Machines and power loom are costly that cannot be afforded everyone.

7.3 Marketing constraints

In Handloom saree production, the marketing constraints are lack of transport facility, lack of communication facility, inadequate demand, lack of proper marketing channel, lack of proper storage facilities etc. About 2.20% respondents said that they had marketing problems. Some of these constraints are explained below:

Lack of proper marketing channel

There is a lack of market opportunities and the marketing system for handloom saree and other products is conventional type. Weavers sell their products at the local hat-bazar. Middlemen are the main beneficiary of their product. There is an information gap between buyer and seller. Weavers are not aware of consumers' preferences. That's why they do not improve their product as well based on consumers' demand.

Lack of proper storage facilities

In handloom saree weaving businesses the weavers have inadequate and proper storage facilities. Due to low quality warehouse facility the weavers could sell their products relatively in low price.

7.4 Social constraints

The social constraints of handloom weaving business include the following changing in the taste of consumers, shortage of electricity and adulation of facilities etc. Some of these problems are explained below:

Change in taste

The availability of foreign products like *saluer*, *kameez* and *kurta* has increased recently. Women are more comfortable with those dresses. For these reasons they were not interested in wearing saree. Most of the women wear saree on special occasions only. Women use saree for short period only for show-off purposes. For this short period purpose people want to spend less amount of money on one saree.

8. Suggested solutions by the respondents

The respondents of handloom saree weavers were asked to suggest some solutions to solve the problem' they faced. These suggested solutions are summarized by a table and discussed below:

Table 20: Suggested solutions by the respondents

Suggested Measures	Agree	Percentage	Disagree	Percentage
Credit facility	90	98.90	1	1.10
Supply of adequate raw materials by the government at reasonable price	91	100	0	0.00
Stable market price	91	100	0	0.00
Health facility	91	100	0	0.00
Transport facility	90	98.90	1	1.10
Training facility	91	100	0	0.00
Electricity facility	91	100	0	0.00

Source: Field Survey, 2023

Credit facility

Handloom weavers need sufficient working capital for moving the wheels of their business. So, for the expansions of handloom weaving business institutional credit facilities should be made easily accessible to the weavers

with easy terms and conditions. About 98.90% of the respondents suggested credit facility as a possible solution to solve the problem they faced.

Training facilities

Government should take proper steps to provide training facilities. 100% respondents suggest that training facilities would improve quality full production.

Electricity facilities

Electricity is one of the most important supports for weaving activity. From the table 100 % weavers suggested for unbreakable power supply facilities.

Supply of adequate raw materials by government at a reasonable price

The raw materials of handloom saree production are yarn, maize, karsin, rice powder etc. About 100 % weavers said that raw materials should be supplied by the government in subsidized prices which would be helpful for the development of their weaving business.

Stable market price

100% respondent weavers said that stable market price would help them to increase their involvement in this business. So, the government should take necessary steps to stable the market price.

Health facility

The work places are congested with unfavorable conditions like, high temperature, high humidity, poor illumination, and high noise level etc. Because of these unfavorable conditions the weavers face various health related problems. The government should take necessary steps for proper health care and medical facilities to ensure sound growth of this sector suggested by 100 % respondents of this study.

Transport facility

98.90% respondent suggested that government should take necessary steps to develop transport facility, which would make profitable their business.

9. Conclusion and recommendations

Handloom weaving is a profitable non-farm business in the study area. Here benefit cost ratio was estimated to be 1.11. In model discussion, R^2 , adjusted R^2 , t, and F was found significant. So, the positive earnings of saree weavers can increase their standard of living. On the other hand, it is an important sector for providing large scale employment in rural areas. Handloom sector

can help to alleviating rural poverty, bring equality in the distribution of income, substituting imports and increasing potentials for export. The study concluded that the majority of the weavers are middle aged and they are literate. So, they are more capable of adopting modern technology. However, the handloom weaving activity is not well recognized and the weavers in the study area face various problems. Traditional handloom weavers now have to compete with power loom products. Facing these problems, weavers now tend to closing their business. Necessary steps should be taken to solve this problem. If the government provides proper training facilities, the quality and production volume of handloom saree will be increased in the study area. The government can adopt some potential policy solutions for the improvement of handloom sector. These are—

- i) Government should provide training on scientific weaving.
- ii) Marketing and communication facilities should be developed.
- iii) The price of saree should be increased to enhance the interest of saree weavers.
- iv) For smooth progress in weaving business political disorder and corruption should be reduced.
- v) Government should provide subsidy to saree weavers to increase the interest in weaving.
- vi) Distribution and collection centers have to be set up for finished products in terms of equal pay to all weavers.
- vii) Technological improvement in the handloom sector.
- viii) Ensure quality health care among the handloom weavers.
- ix) Introduce handloom loan with low interest rate and out of any kind of taxation.
- x) Import raw materials and export of final product of handloom sector as duty free.
- xi) Opening special online and offline platforms to sell handloom products.
- xii) Setting up a minimum wage scale for handloom workers.

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Conflict of interest

The author declares no conflict of interest.

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