



Challenges to the Economic Viability of Jute and Value-Added Jute Products in Selected Area of Bangladesh

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Abstract

Jute is the cornerstone of Bangladesh's fiber sector and makes a substantial contribution to the economy. This study sought to evaluate the profitability and value-added activities of various stakeholders in jute production and marketing, along with the challenges. The present study purposively selected the Madaripur and Faridpur districts. This investigation included 148 randomly selected samples, 120 of which were collected from farmers in two districts, with 60 samples from each district. The remaining 28 samples consisted of 11 faria, 14 mahajon and three processors. The study revealed that jute production yielded an average of 2,103 kg/ha, generating a gross return of Tk. 173,146, with a total cost of Tk. 105,624, resulting in a net return of Tk. 67,522 and the benefit-cost ratio (BCR) was 1.64, significantly enhancing farm profitability. Econometric analyses, including a logit model, were employed to identify the key determinants of jute cultivation. The results revealed that age, family size, training, credit, and more profitable than competitive crops significantly influenced the willingness/adoption of jute cultivation ($p < 0.05$), whereas education and annual income had negative effects. The study revealed that farmers gained the highest value addition at Tk. 20.37/kg (37.14% return on cost) compared with faria (Tk. 2.10/kg; 1.48%), and mahajon (Tk. 2.78/kg; 1.55%). The key challenges in jute production are high seed prices (73%), labor shortages (76%), and high wages (78%), whereas traders and processors face severe financial and supply uncertainties (73-100%), which limit productivity and profitability.

Keywords: Adoption drivers, Economic viability, Value addition Challenges

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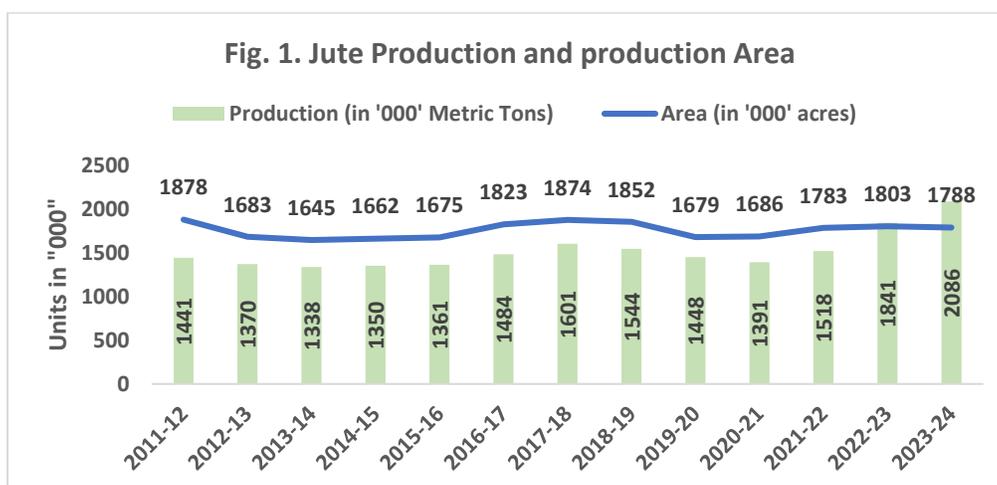
Introduction

Jute (*Corchorus capsularis* L. and *Corchorus olitorius* L.) is a globally produced natural best fiber, with an estimated annual production of 3.4 million tons (FAOSTAT, 2016). It is cultivated under diverse climatic conditions, primarily in underdeveloped nations such as Bangladesh, a low-lying, highly populated country susceptible to climate-induced agricultural disruption. The nation, situated in the Ganges-Brahmaputra Delta, is vulnerable to elevated sea levels, saltwater intrusion, recurrent flooding, storm surges, and extended droughts (Shapna et al., 2024; Rahman and Anik, 2020; Al Mamun et al., 2024; Kundu et al., 2025).

As an agrarian nation, Bangladesh depends on environmentally sustainable farming methods for development. Agroecology serves as a robust strategy to alleviate poverty and safeguard environmental resources, especially in rural regions of developing nations (Pronti & Coccia, 2020, 2021). Jute, a natural fiber recognized for its adaptability, durability, versatility, recyclability, biodegradability, and environmental sustainability (Ferdous & Hossain, 2017; Rahman et al., 2017; Islam & Alauddin, 2012; Basu & Roy, 2008), has emerged as an optimal alternative to plastics, nylon, and polypropylene (Paulsen, 2022; Rahman et al., 2017; Islam & Alauddin, 2012).

Jute is the second most abundant and utilized natural fiber (Khandaker et al., 2024; Mohiuddin, 2015; Olaoye et al., 2013; Basu & Roy, 2008). Despite the existence of over 40 jute species, only two are economically cultivated: *Corchorus capsularis* L. (usually referred to as white jute) and *C. olitorius* L. (often known as Tossa or traditional jute). The planting period differed marginally between the two jute varieties. In Bangladesh, traditional Tossa jute is cultivated in low-lying areas, with planting occurring in March and April, whereas white jute is sown in April and May. A significant attribute of jute is its lack of health risks and environmental contamination (Rahman et al., 2013). It is the oldest and most commercially essential sector in Bangladesh. According to the Government of Bangladesh's "Industrial Policy 1999 and 2010," various jute products have been recognized as a crucial sector (Islam, 2019). Jute, along with rice and tea, is one of the three principal crops in Bangladesh, distinguished by its superior quality in terms of color, texture, length, and strength (Mohiuddin, 2015). Bangladesh ranks as the second-largest producer of jute fiber globally, contributing 30% to the worldwide output (Rahman et al., 2017; Siddiqui, 2018), and dominates global exports of raw jute and jute products, representing over 40% of the market. Since gaining independence, jute has been a fundamental component of Bangladesh's export revenue, historically accounting for 2.69% of total exports (Rahman et al., 2017; Sharna & Kamruzzaman, 2020).

Farmers in Bangladesh cultivate other crops alongside rice, which serves as a staple, to satisfy both their subsistence and cash requirements (Rahman, 2009). It is broadly acknowledged that in non-irrigated or semi-irrigated environments, enhanced agricultural practices and varietal advancements in non-cereal crops (such as jute) will yield greater profitability and facilitate crop diversification, serving as an effective strategy for the future development and sustainability of Bangladeshi agriculture (PC, 1998, 2011; IMF, 2005).



Source: Bangladesh Bureau of Statistics, 2024

Literature review

Jute is an important crop in South Asia because of its income-generating potential and agro-ecological advantages; however, the profitability from growing jute is based on production, labor availability, adoption technology, and linkages between value chain. There is empirical evidence that adoption of improved cultivation practices leads to substantial increase in net returns. Lal et al. (2023) found higher benefit–cost ratios from jute farming in India, additionally, Sharma et al. (2024) reported that the cultivation of jute in Nepal was still profitable, but increasingly constrained by high labor costs and labor shortages. In Bangladesh, studies report moderate profitability and high spatial variance. Hassan et al. (2018) found that the cost and profit of production vary substantially among existing regions, which could be attributed to local conditions. Climate variability also has an impact on productivity; Shuversa et al. (2022) reported that rainfall, temperature, and relative humidity all create a major effect on jute yield; in other words, they increase production risk. Value addition and performance of the institutions are important for sectoral results. Collective

initiatives and market expansion enhance value realization (Ahmad et al., 2023; Aurora and Haider, 2024), but downstream inefficiencies like mismanagement, outdated equipment, lack of skills and high costs continue to constrain performance (Hossain and Nishu, 2021; Masum et al., 2025).

Research gap

However, even though there have been quite many researches works in this area, the evidence is generally aggregated and location independent. This study is conducted in the districts of Madaripur and Faridpur, the two important jute-producing regions in Bangladesh. Moreover, existing studies rarely integrate profitability, production drivers, value addition and stakeholder problems in one analytical model. This research tries to bridge this gap by presenting a district based integrated assessment of jute production and value addition, providing context-sensitive insights to support sustainable and productive jute sector development. Considering this perspective, the current study was undertaken with the following objectives: i. To estimate the profitability of jute production, ii. To estimate the driver of jute production; ii. To evaluate the value of addition activities in jute products and iii. To identify and assess the challenges encountered by different stakeholders in the jute sector.

Methodology

Study area, sampling procedure and sample size

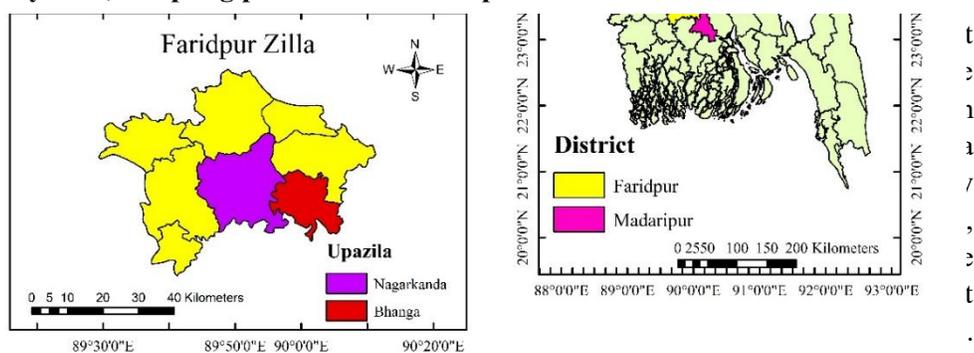


Fig. 2. Map of the study area. The map was generated using ArcGIS version 10.8 software (<https://www.arcgis.com/index.html>). The administrative shape file of Bangladesh, published by the Bangladesh Agricultural Research Council (BARC) under a CC BY licence, served as the basis for the map creation.

Method of data collection

This research relied primarily on primary data collected through interviews conducted between January to June 2023, with a few exceptions. Cross-sectional

field data were gathered by independent field investigators directly under the researcher's supervision, utilizing a pretested interview protocol. This study was conducted to identify critical information concerning input prices, pricing, yields and value-added goods made from jute.

Analytical technique

The profitability of jute farming was evaluated following the conventional analytical approach developed by Dillon and Hardaker (1980). Furthermore, consistent with previous empirical studies, the profitability function employed by Uddin et al. (2024) and Khandokar et al. (2016) was utilized to examine the economic viability of jute cultivation.

$$\Pi = P_j Q_j + P_b Q_b - \sum (P_{X_i} \cdot X_i) - \text{other costs}$$

Where,

Π = Profit from jute production (Tk ha⁻¹);

P_j = Price of jute (Tk kg⁻¹);

Q_j = Quantity of jute (Tk kg⁻¹);

P_b = Price of by-product (Tk kg⁻¹);

Q_b = Quantity of by-product (Tk kg⁻¹);

P_{X_i} = Price of ith inputs (Tk kg⁻¹);

X_i = Quantity of ith inputs (kg); and

$i = 1, 2, 3, \dots, n$

Logit regression model

The current study employs a logit model because the dependent variable, adoption of jute cultivation, is binary (i.e., adopter of jute = 1, non-adopter/adopt other crops = 0), making the logit framework the most appropriate and statistically robust choice. The logistic probability function is cumulative in the logit model because the approach is easy to analyze and the findings are easily understandable (Greene et al., 2008). Moreover, compared with linear probability models, the logit model avoids issues such as heteroskedasticity and unrealistic predicted probabilities (Greene, 2008). Therefore, the logit framework is methodologically sound for identifying the key determinants of jute cultivation adoption in the study area. The model is based on the cumulative logistic distribution function used by Kundu et al. (2024) and Sarkar et al. (2025), as expressed below,

$$P_i = E\left(Y = \frac{1}{X_i}\right) = \alpha + \beta_i$$

$$P_i = E \left(Y = \frac{1}{X_i} \right) = \frac{1}{1 + e^{-z}}$$

Where P_i = Probability of willingness to adopt jute farming

The log of odd ratio or logit is,

$$\begin{aligned} \text{Logit } (Z_i) &= \frac{\{\text{The probability to adopting jute cultivation}\}}{\{\text{The probability of not adopting jute cultivation}\}} \\ &= \alpha + \beta_i X_i + U_i \end{aligned}$$

For ease of exposition

$$\begin{aligned} Y_i = \ln \left(\frac{P_i}{1 - P_i} \right) &= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 \\ &+ E_i \end{aligned}$$

Here, P_i denotes the probability of either adoption or nonacceptance of jute farming. $P_i = 1$ signifies adoption, whereas $P_i = 0$ denotes non-adoption; Dependent variable: adoption of jute cultivation. Y_i = likelihood of adopting jute farming; Independent variables: X_1 = age (years); X_2 = education level; X_3 = family size (number); X_4 = farm size (hectares); X_5 = annual income (lakhs); X_6 = training facilities ($P_i = 1$ signifies training in jute agriculture, whereas $P_i = 0$ signifies absence of training in jute cultivation); X_7 = credit facilities (yes = 1); X_8 = extension services (yes = 1); B_0 represents the intercept; B_1 through β_8 denote the regression coefficients of the independent variables; and E_i represents the error term.

The marginal probabilities of the primary factors influencing the adoption of jute farming were calculated via formulas derived from the marginal effect of the logit model as follows:

$$\frac{dk}{dx} = \beta_i \{P_i (1 - P_i)\}$$

where β_i is the estimated logit regression coefficient with respect to the i^{th} factor and P_i is the estimated probability of farmers' adoption status.

Analysis of jute value addition

Value addition is the total sales of a firm minus purchases of inputs from other firms. What is left is available for the wages of its employees and the profit of its owners (Black, 2008). In addition, Kohls and Uhl (2005) define value addition as the price of all utility-adding activities and functions that are performed by intermediaries.

The value contributions of various stakeholders were assessed as follows:

- I. Value addition by jute farmers
 - Value addition = sales price – production cost.
 - Net margin = Value addition – Marketing cost.
- II. Value addition by jute traders

Value addition = sales price – purchase price.

Net margin = Value addition – Marketing cost.

III. Value addition by jute manufacturer/processor = Sales price – Manufacturing cost.

Results and Discussion

Sociodemographic profile of the sample farmers

Table 1 presents the descriptive statistics of variables influencing jute production adoption. The average age of farmers is 47.05 years with a wide range (2-73 years) and a standard deviation of 11.98. Education duration averages 5.97 years, with variability in education levels (0-12 years). Family size averages 5.38 members with a range of 2-10 and a standard deviation of 1.57. The average farm size is 0.45 hectares, with variability from 0.08 to 3.00 hectares. Annual income has a mean of 1.34 lakh taka, with a range of (0.75-1.94) and low standard deviation (0.26). The mean values for training, credit, and extension services are 0.69, 0.63, and 0.61, respectively, showing a binary access pattern. These statistics help understand the sample's demographic and socioeconomic characteristics related to jute production adoption.

Table 1. Descriptive Statistics of the Variables Influencing Jute Production Adoption

Particulars	Mean	Std. Dev.	Min	Max
Age	47.05	11.98	2	73
Education	5.97	2.94	0	12
Family size	5.38	1.57	2	10
Farm size	0.45	0.37	0.08	3.00
Annual income	1.34	0.26	0.75	1.94
Training facilities	0.69	0.46	0	1
Credit facilities	0.63	0.48	0	1
Extension services	0.61	0.49	0	1

Source: Author's estimation, 2023.

Share of jute land of the sample farmers

Table 2 compares the cultivated areas for jute farming in Madaripur and Faridpur. Madaripur has 0.84 hectares of total agricultural area, with 0.32 hectares (38%) dedicated to jute. Faridpur has a slightly larger total area of 0.96 hectares, with 0.39 hectares (41%) for jute. Together, both districts cover 1.8 hectares of cropped area, with 0.71 hectares (39%) allocated to jute. While Faridpur has a larger total area, the percentage of jute land is similar in both districts, highlighting the importance of jute farming in the region.

Table 2. Share of jute land used by the sample farmers

Type of farmers	Cropped area (ha)				% of jute land of the total cropped area
	Jute land	Rice land	Others	Total	
Madaripur	0.32	0.44	0.08	0.84	38
Faridpur	0.39	0.46	0.11	0.96	41
Total	0.71	0.9	0.19	1.8	39

Source: Field survey, 2023.

Cropping patterns of the sample farmers

Table 3 highlights that jute is the dominant crop in all seasons, though farmers grow various crops to mitigate risks and adapt to weather changes. About 13% of farmers cultivate jute during the Aus season, with some land left fallow, suggesting slower growth or future use of soil. In the Aman season, 19% grow onions alongside T. Aman, wheat, lentils, and mustard, showing adaptability. Only 3% grow Boro rice, likely due to its higher costs and water needs, while jute remains dominant.

Table 3: Jute-based cropping patterns in the study area (% of farmers responded)

Seasonwise crops			
Aus season	Aman season	Boro season	% of farmers
Jute	Fallow	Mustard	13
Jute	T. Aman	Wheat	8
Jute	T. Aman	Lentil	7
Jute	T. Aman	Potato	11
Jute	T. Aman	Onion	19
Jute	Fallow	Wheat	9
Jute	Aman	Mustard	6
Jute	Fallow	Onion	12
Jute	Fallow	Boro	12
Jute	Aman	Boro	3

Source: Field survey, 2023.

Profitability of jute production

The profitability of jute production in Madaripur and Faridpur shows similarities in cost structures, yields and overall profitability. Both regions have similar variable costs with hired labor being the largest expense, constituting 59% of total costs. Faridpur has slightly higher labor costs than Madaripur, suggesting regional differences in labor demand or costs. However, other costs, such as seed, fertilizer, and power tiller expenses, are similar, with Faridpur showing slightly lower costs for fertilizers and power tillers.

Table 4. Profitability of jute production

Particulars	Madaripur	Faridpur	All areas	% of total cost
A. Variable cost	61,941	62,261	62,101	59
Hired labor□	36,672	37,224	36,948	35
Seed cost	1,458	1,628	1,543	1
Fertilizers cost	6,654	6,494	6,574	6
Power tiller	7,654	7,216	7,435	7
Pesticides	1,367	1,499	1,433	1
Transportation	2,687	2,879	2,783	3
Manure	1,765	1,605	1,685	2
Interest on operating capital	3,684	3,716	3,700	4
B. Fixed cost	43,726	43,320	43,523	41
Land use cost	9,875	9,135	9,505	9
Family labor□	33,851	34,185	34,018	32
C. Total cost (A+B)	105,667	105,581	105,624	100
Yield	2,096	2,110	2,103	
Return from the main product	147,985	148,957	148,471	
Return from byproduct	23,568	25,782	24,675	
D. Gross return	171,553	174,739	173,146	
E. Gross margin(D-A)	109,612	112,478	111,045	
F. Net return(D-C)	65,886	69,158	67,522	
G. BCR on variable cost(D/A)	2.77	2.81	2.79	
H. BCR on Total cost(D/C)	1.62	1.66	1.64	
I. Production cost per kg	50.41	50.04	50.23	

Source: Author's estimation, 2023.

Fixed costs show minimal differences between Madaripur and Faridpur, with Faridpur having slightly lower land-use costs and higher family labor costs. Both districts have similar overall costs, averaging around 105,624. Faridpur slightly

outperforms Madaripur in yield (2,110 kg/ha vs. 2,096 kg/ha), leading to higher gross returns, gross margin, and net return (69,158 vs. 65,886). Faridpur's better cost-efficiency is reflected in a higher benefit-cost ratio (1.66 vs. 1.62). Although Madaripur has a slightly lower production cost per kilogram of jute (50.41 vs. 50.04), the difference is negligible in overall profitability.

Determinants of jute cultivation adoption decision

A logit model was used to analyze the factors influencing the adoption of jute cultivation. For this logit model, the adoption decision (1 = adopted jute, 0 = not adopted) was the binary dependent variable. The findings are shown in Table 5, which reveals a number of predictors that significantly explain adoption decisions. In the case of adoption decision of jute cultivation, age (coefficient=0.048; $dy/dx=0.005$, $p = 0.036$) and family size (coefficient=0.455; $dy/dx=0.051$ and $p = 0.016$) show strong significant positive relationships at the 5% level. These results indicate that older farmers with greater family size are more likely to grow jute, as indicated by positive coefficients whose exponentiated values show increased likelihood of adoption for each additional year of age or family member. However, younger farmers dislike jute cultivation due to migration, salaried jobs, and cultivation of high-value or short-duration crops that offer faster income and greater social mobility compared to jute. The marginal effects of 0.005 and 0.051 for age and family size suggest that for every one-unit increase in age and family size, the probability of cultivating jute increases by 0.05% and 5%, respectively. Chatterjee et al. (2022) found that younger farmers with less experience and motivation are more likely to refuse or cease jute cultivation. Ghorai et al. (2020) showed that small families in West Bengal and Bangladeshi farmers cultivate less jute because of the higher cost of cultivation and lower income. On the other hand, the negative education coefficient (-0.242) indicates an inverse relationship between the level of education and the probability of growing jute. The marginal effect is -0.027, which suggests that a unit increase in education reduces the probability of growing jute by 2.7%. This result is significant at the 5% level ($p = 0.018$), indicating that education serves as a disincentive to adopt jute cultivation. The higher the education level, the more likely people are to lose interest in and have a negative attitude towards traditional jute farming. This also implies that education would lead people to cultivate other high-value crops than jute farming, which will reduce the attraction of cultivating crops like jute. Rahman et al. (2023) noted that a larger number of educated people are producing other crops than jute due to the poor performance of jute entrepreneurship and to see the scope of other agri-entrepreneurship enterprises in Bangladesh. Farm size, however (coefficient=0.368; $dy/dx= 0.041$ and $p=0.67$), was not significantly related to adoption, meaning that farm size is not a significant determinant of whether a farmer will adopt jute cultivation. Annual income (coefficient =- 2.036, $dy/dx = -0.227$) was found to have a negative association with jute growing, meaning that richer individuals are less likely to be involved in jute cultivation. This finding is significant at the 10% level, indicating that individuals

earning higher income may move away from jute cultivation to other crops as they have greater opportunities for other agricultural and non-agricultural profitable activities. Sharma et al. (2024) studied jute cultivation in Sunsari, Nepal, and observed that although it provides income and employment to poor farmers, low prices and profitability were forcing some of them to shift towards crops such as sugarcane and maize.

Table 5. Factors influencing the adoption decision of jute cultivation

Particulars	Coefficient	Std. err.	z	P>z	dy/dx
Age	0.048	0.023	2.1	0.036**	0.005
Education	-0.242	0.102	-2.37	0.018**	-0.027
Family size	0.455	0.189	2.4	0.016**	0.051
Farm size	0.368	0.863	0.43	0.67	0.041
Annual income	-2.036	1.167	-1.74	0.081*	-0.227
Training facilities	2.268	0.621	3.65	0.000***	0.253
Credit facilities	1.999	0.641	3.12	0.002***	0.223
More profitable than competitive crops	1.550	0.582	2.66	0.008***	0.173
_cons	-3.513	2.154	-1.63	0.103	
Number of obs	120				
LR chi2(8)	69.68				
Prob > chi2	0				
Pseudo R2	0.448				
Log likelihood	-42.856				

Note: ***, ** and * indicate significance at the 1%, 5% and 10% probability levels, respectively.

Source: Author's estimation, 2023.

Adoption decisions are closely related to training facilities (coefficient=2.268; dy/dx=0.253 and p = 0.000), credit facilities (coefficient=1.999; dy/dx=0.223 and p = 0.002), and more profitable than competitive crops (coefficient=1.550; dy/dx=0.173 and p = 0.008) at different significance levels. This result indicates that these variables increase the likelihood of adopting jute cultivation. Chatterjee et al. (2022) revealed that the training increased acceptability of new jute technologies raising yield and income and reducing cost in farming, which could encourage to cultivate jute. This finding aligns closely with the evidence of Uddin et al. (2026) and khatun et al. (2014) who reported that credit availability plays a critical role in enabling farmers to overcome capital constraints and adopt improved

agricultural practices by easing the burden of upfront production costs. The goodness of fit of the model is judged by a highly significant LR chi-squared value (69.68; $p = 0$) and Pseudo R^2 of 0.448, indicating that the model accounts for approximately 45% variation in willingness to grow jute. A log likelihood of -42.856 indicates a good fit in this study. These findings reveal that training, credit and perceived profitability are the major factors that promote jute production, while education and income act against its cultivation. In general, the above results indicate that the most successful approaches to promoting jute production would be by improving access to training, credit and more profitable crops (rather than competitive ones), bearing in mind demographic factors such as age and household size.

Value-added activities of jute and jute products

This section outlines the participants in the jute value chain and examines the value-added activities of growers, traders and manufacturers. Value added refers to the difference between total sales revenue and the cost of acquiring inputs from various enterprises.

Table 6. Value addition activities of jute by different stakeholders

Particulars	Producers	Faria	Mahajon
a. Production cost/purchase price (Tk./kg)	50.23	70.6	72.7
b. Marketing cost (Tk./kg)	1.25	1.04	1.63
c. Sales price of jute (Tk./kg)	70.6	72.7	75.48
d. Value addition (c-a) (Tk./kg)	20.37	2.1	2.78
e. Net margin (d-b) (Tk./kg)	19.12	1.06	1.15
f. Return on cost/(a+b)}x100	37.14%	1.48%	1.55%

Source: Author's estimation, 2023.

Value addition is the difference between the price received by the farmer and the price paid by the consumer (Acharya & Agarwal, 2004) and it reflects the utility generated at each stage of production. The marketing margin is the difference between the price paid by the consumer and the price received by the producer, accounting for the costs incurred by intermediaries for adding value to the product (Kohls & Uhl, 2005). Additionally, disposable income is allocated to employee wages and owner profits (Black, 2008).

Value addition by jute producer

Table 6 shows that jute producers incur a production cost of Tk. 50.23 per kg and sell it for Tk. 70.6 per kg to the faria, with a promotion cost of Tk. 1.25 per kg. The value added is Tk. 20.37 per kg, and the average margin is Tk. 19.12 per kg, resulting in a return on cost of 37.14%.

Value addition by Faria

Table 6 shows that the faria purchases jute at Tk. 70.6 per kg and sells it at Tk. 72.6 per kg, adding Tk. 2.1 per kg in value. After accounting for a marketing expense of Tk. 1.04 per kg, the net profit for faria is Tk. 1.06 per kg, resulting in a return-on-cost of 1.48%.

Value addition by Mahajon

Table 6 shows that the mahajon buys jute at Tk. 72.7 per kg and sells it at Tk. 75.48 per kg, adding Tk. 1.63 per kg in value. After a marketing expense of Tk. 0.94 per kg, the net margin is Tk. 0.69 per kg, with a return on cost of 1.30%.

Value addition by Jute Processor

Table 7 presents value additions in jute fiber processing, based on data from local processors like Gono Unnyan Prochesta. For small baskets, the value addition is Tk. 5 per piece, which is 33% of the production cost. The highest value-added product is the 6 ft² carpet, with a value addition of Tk. 75% of the production cost, requiring an investment of Tk. 1,520 for 200 pieces. While some high-value products offer strong returns, others have less potential due to material and manufacturing complexities. These findings are crucial for enhancing economic sustainability in the jute sector.

Table 7. Value-added activities of processors

Value-added product of jute	Usage	Production cost (Tk./Piece)	Sale price (Tk./piece)	Value addition (Tk./piece)	Value addition as a % of production cost
Basket (Small)		14	19	5	33
Fruit basket		40	65	25	62
Table mat	Dining use	15	19	3	22
Aruna mat		76	111	35	46
Apple mat		29	39	10	36
Nila Mat 2 ft ²		67	74	8	11
Wallmat (Star)		25	32	7	30
Diamond place mat		67	93	26	39
Bird		17	28	11	62
Bell	Home decoration	21	30	9	44
Elephant		13	19	5	39
Flower vase		38	65	27	70
Papos		114	130	16	14
Door curtain		430	500	70	16
Window curtain		285	370	85	30
Carpet 6 ft ² .		1520	1720	200	13
Fish	Baby	11	19	7	62

Value-added product of jute	Usage	Production cost (Tk./Piece)	Sale price (Tk./piece)	Value addition (Tk./piece)	Value addition as a % of production cost
Butterfly	toy	11	20	9	75
Pitcher		10	15	5	56
Horse		25	37	12	50
Pen vase	Reading table	48	74	27	56
Tray		67	93	26	39
Vanity bag		114	185	71	62
Market bag	Others	38	56	18	46
Mobile bag		67	93	26	39

Sources: Field survey and authors' estimation, 2023.

Challenges of the Jute Sector

Stakeholders in jute production and marketing face various challenges discussed as follows:

Challenges faced by farmers

High price of seed

The high cost of quality seeds affects 73% of jute farmers in Bangladesh. This forces farmers to use local low-quality seed, lowering yields and profitability. Akter et al. (2020) noted that the lack of affordable, quality seeds limits yields and economic opportunities in the jute industry.

High irrigation cost:

Irrigating jute requires a reliable water source, but 50% of farmers face high irrigation costs due to insufficient rainfall and poor infrastructure. This results in reduced acreage or low yields. Sharma et al. (2024) found that high costs and low prices made jute farming less viable in Sunsari, leading farmers to switch to more profitable crops like sugarcane and maize.

Lack of retting place:

Retting, essential for quality jute fibers, is hindered by 59% of farmers due to limited space and water access, leading to poor fiber quality. Ghorai et al. (2020) found that water scarcity and wastewater exposure disrupt retting and livestock integration in Bangladesh, especially during dry periods.

Shortage of labor:

About 76% of jute farmers face labor shortages, worsened by migration and reluctance of youth to work in agriculture, raising costs. Karim et al. (2021) addressed this with a low-cost, power-operated jute fiber extraction machine to combat the labor crisis and rising wages.

High labor wage:

About 78% of farmers face high labor wages due to shortages, raising production costs, especially for small farmers. Hossain and Nishu et al. (2021) found that labor shortages in Bangladesh were costly, with state-owned mills requiring over 90 workers to produce one ton of sacking.

Lack of adequate knowledge about retting

Proper retting is crucial for quality fibers, but 46% of farmers lack the knowledge to do it effectively, leading to poor fiber quality and yields. Ali et al. (2022) found that inadequate training, outdated methods, and poor water quality contributed to fiber degradation in Bangladesh due to farmers' lack of knowledge on proper retting techniques near streams.

Insect attack

Sixty-seven percent of farmers responded that pests like jute weevils and aphids as major threats to crop quality. Rashid et al. (2024) found that the yellow mite *Polyphagotarsonemus latus* significantly damaged jute quality and yield in Bangladesh, with management strategies varying by cultivar.

High transportation costs for selling

Sixty-three percent of farmers report high transportation costs due to poor roads, expensive fuel and long distances, reducing profits and market access. Anoop et al. (2023) found that these costs hinder marketing efficiency and profitability for jute growers in West Bengal's Cooch Behar district.

Challenges faced by Faria**Lack of money:**

Seventy-three percent of traders lack sufficient capital, limiting their ability to purchase, store, or transport jute, which slows market flow and impacts farmers. Kumar et al. (2024) found similar challenges in Harda, India, where financial constraints and poor loan access hinder input dealers from supporting farmers' production needs.

Scattered jute production:

The widespread distribution of jute crops in Bangladesh hampers efficient trading, with traders facing delays and high costs in collecting and transporting jute to central markets. Anoop et al. (2023) identified transportation issues as a key challenge, with sourcing jute being time-consuming in Cooch Behar due to limited markets.

Challenges faced by Mahajon**Uncertainty of getting price from Processors**

Sixty-four percent of jute growers face price uncertainty due to unpredictable prices and lack of transparency, with millers controlling pricing. This destabilizes the

market and discourages investment. Sun et al. (2021) found that trade policy uncertainty (TPU) causes price fluctuations, affecting supply and demand and making price prediction difficult.

Table 8: Challenges faced by different stakeholders and probable solutions

Challenges faced by farmers	Responded (% responded)	Probable solutions to the problems
High price of seed	73	Decrease the price of seed, develop HYV of jute
High irrigation cost	50	Digging of a channel for irrigation
Lack of a retting place	59	Develop modern technology for the retting of jute fiber where less water is needed.
Shortage of labor	76	Proper mechanization
High labor wage	78	Proper mechanization
Lack of adequate knowledge about retting	46	Training on modern retting technique
Attack of insects	67	Proper use of pesticides
High transportation costs for selling	63	Decrease the fuel cost and maintain proper control over the vehicle
Challenges faced by faria		
Lack of money	73	Facilitates a bank loan with a low interest rate
Scattered jute production	82	-
Challenges faced by mahajon		
Uncertainty of getting price from processors/millers	64	Ensure a fair price at the right time
Challenges faced by processors		
Uncertainty of raw jute	100	Availability of raw jute at the proper time
Uncertainty of product order	100	Coordination among stakeholders
Challenges faced by extension service providers		
Lack of adequate manpower	100	Recruitment of more manpower for the extension service

Source: Authors' estimation, 2023

Challenges faced by Processors

Uncertainty of raw jute:

All processors face uncertainty about raw jute availability, with 100% citing it as a major challenge. This unpredictability is caused by weather impacts, labor shortages, and market instability. Kalita and Bhuyan et al. (2021) noted that fluctuating demand has led jute farmers in Assam to explore sustainable farming strategies to mitigate reduced profits.

Uncertainty in Product order:

Processors are concerned about fluctuating jute demand, with 100% responding to it as a key issue. Market volatility, changing consumer trends and synthetic materials cause overproduction or underproduction, leading to cost deficits. Wang et al. (2024) highlighted that demand uncertainty disrupts supply chain stability, causing inefficiencies in the flow of agricultural goods.

Challenges faced by extension service providers

Lack of adequate manpower

The shortage of trained extension service providers limits farmers' access to education and modern practices, leading to outdated methods and reduced productivity. Sreekanth and Podikunju et al. (2024) identified constraints such as financial challenges, delayed salaries, and poor implementation of crop programs, hindering agricultural progress.

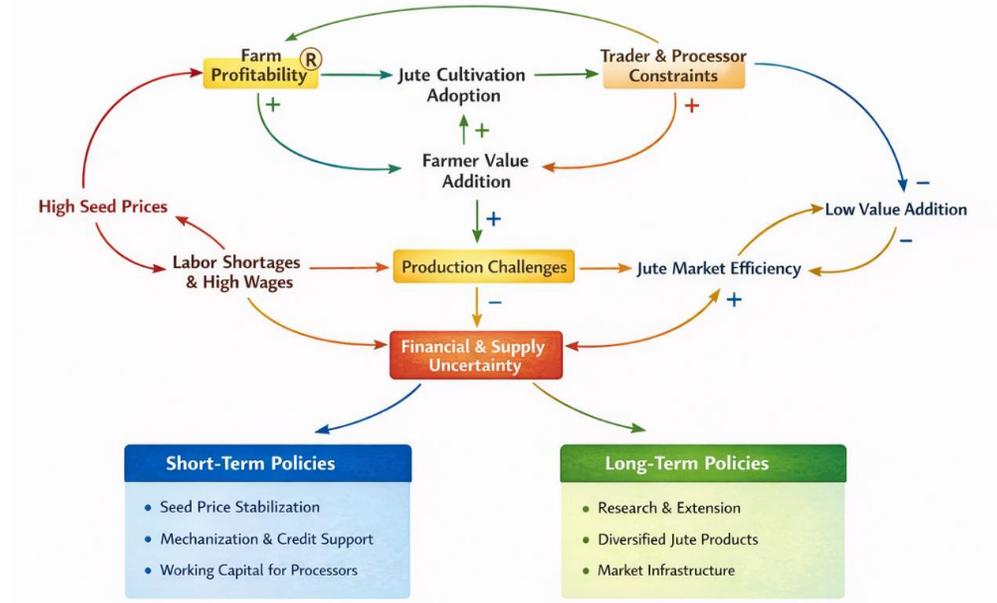


Fig 3. Causal loop diagram for the dynamics of jute cultivation and value addition

The jute industry faces inefficiencies, with high seed prices, labor shortages and market inefficiencies undermining farm profitability. To stabilize, short-term policies should focus on seed price stabilization and credit support, while long-term policies should target R&D, infrastructure and product diversification for sustainable profitability.

Conclusion

Jute production in Madaripur and Faridpur is economically viable, with high margins. The analysis shows that factors such as farmers' age, family labor availability, training and credit services positively influence jute cultivation, while higher education and income levels are negatively correlated with adoption, as wealthier households tend to shift to other crops. Despite its profit potential, the jute industry faces long-term structural issues, including high production and marketing risks, costly inputs, labor shortages, poor retting practices, pest issues, and post-harvest inefficiencies. While value-added products like mats and carpets offer significant earning potential, challenges such as limited access to modern technology, poor market linkage, capital shortages, and supply uncertainty persist. These findings suggest that jute farming's sustainability depends on addressing production constraints and market inefficiencies.

Policy Implications

Priority Policy Focus

Policy responses should focus on:

1. Minimizing production and postharvest constraints that directly reduce farm profits.
2. Strengthening value addition and market efficiency to maintain strong incentives for farmers and processors.

Short-Term Policy Interventions

- Stabilize seed prices, ensure timely availability of quality inputs and promote mechanization to address labor shortages and high wage costs.
- Provide training through the DAE and research organizations on improved cultivation practices, pest management and retting techniques to address knowledge gaps and manpower shortages.
- Facilitate short-term credit from banks, MFIs and NGOs to ease working capital constraints for farmers and processors.
- Ensure predictable procurement mechanisms and transparent pricing by BJMC and private processors to reduce uncertainty in raw material demand and farm gate prices.

Long-Term Policy Interventions

- Invest in eco-friendly retting technologies to improve fiber quality, reduce environmental damage and minimize postharvest losses.
- Support research, innovation, and commercialization of diversified jute products, while strengthening market linkages.

- Enhance coordination among the DAE, BJMC, research institutions and private actors to align production, processing and marketing strategies.
- Invest in transport, storage and market infrastructure to reduce transaction costs and improve market efficiency.

The study emphasizes that a combination of short-term support and long-term structural investments is critical for enhancing the sustainability, competitiveness, and profitability of Bangladesh's jute sector, ensuring lasting economic benefits for farmers and value-chain actors.

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