

PROFITABILITY OF *TULSHIMALA* RICE: INSIGHTS FROM SHERPUR AND NETROKONA DISTRICTS OF BANGLADESH

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ABSTRACT

This study seeks to examine the profitability of *Tulshimala* rice, and the challenges encountered by farmers in the Netrokona and Sherpur districts. The results reveal that the total production cost of *Tulshimala* rice stands at 92,821 Tk/ha. Labor costs dominate the expenditure, accounting for 45.06% of the total cost. Overall input costs represent 72.22% of the total, while fixed costs comprise the remaining 27.78%. Within the fixed costs, the highest share is attributed to land rental value, which constitutes 32.99% of the total production cost. The Benefit-Cost Ratio (BCR) is calculated at 1.40 based on full costs and 1.94 based on current costs. Key constraints to aromatic rice production in Bangladesh include labor shortages, pest and disease issues, high labor costs, crop lodging and attitude of local farmers.

Key words: Profitability, *Tulshimala*, aromatic rice

Introduction

Aromatic rice, known for its fragrant, perfumed, scented, flavored, or pecan varieties, has a rich history in South and South-East Asia, earning high esteem (Itani *et al.*, 2004). *Tulshimala*, a prominent local variety, stands out for its yield performance, surpassing the average for aromatic rice in Bangladesh, estimated at 2.54 t/ha (Mamunur Rashid *et al.*, 2017). In the 2017-18 period, Sherpur and Netrokona districts allocated approximately 17,580 hectares for *Tulshimala* rice, constituting 8.6% of the total Aman area, resulting in a production of 43,570 tons of clean rice with an average yield of 2.27 t/ha (DAE, 2018). Despite its high quality and popularity in local markets, the production and marketing of Bangladeshi aromatic rice face numerous challenges. Although the country's aromatic rice, including *Tulshimala*, is globally recognized, it remains relatively obscure in the international market due to limited production and insufficient trade connections with proper storage facilities (Das and Baqui, 2000). These bottlenecks restrict the potential for widespread recognition and export growth, underscoring the need for targeted interventions to improve the value chain, particularly in post-harvest management and international marketing strategies. While some research has examined the marketing of fine-grain rice in Bangladesh, no specific study has focused on the profitability and production challenges of *Tulshimala* rice. Addressing this gap, the present study aims to provide valuable insights for producers, traders, consumers, researchers, and planners engaged in the production and distribution of *Tulshimala* rice. Understanding the economic viability and challenges of *Tulshimala* production is crucial for devising strategies that enhance its profitability and sustainability, ultimately contributing to the improvement of rural livelihoods and the national economy. Hence, this study has been conducted with the following aims: i) to identify the challenges within the farming system of *Tulshimala* rice production and ii) to evaluate the profitability of *Tulshimala* rice production.

Materials and Methods

Primary data were collected from the Sherpur and Netrokona districts, which were intentionally selected for their high concentration of *Tulshimala* rice cultivation and distribution. A sample of 80 *Tulshimala* rice farmers was chosen, with 40 respondents from Sherpur and 40 from Netrokona. Data were obtained through a structured interview schedule, focusing on individuals involved in the production, processing,

and trading of aromatic and fine rice. The survey took place between February and April 2019, and the collected data were analyzed using tabular and descriptive statistical techniques.

Profitability analysis: The following profit equation was employed to assess the profitability of aromatic rice production. Net margin/return of producer.

$$\Pi = TR - TC$$

Where,

Π = Net return (Tk/ha)

TR = Total return (Tk/ha)

TC = Total costs (Tk/ha)

$$\Pi = \sum Q_y \cdot P_y + \sum Q_b \cdot P_b - \sum_{i=1}^n (X_i \cdot P_{xi}) - TFC$$

Where, Π = Net returns (Tk/ha);

Q_y = Total quantity of (paddy) output (kg/ha);

P_y = Per unit price of (paddy) output (Tk/kg);

Q_b = Total quantity of the concerned byproduct (kg/ha);

P_b = Per unit price of the relevant byproduct (Tk/kg);

X_i = Quantity of the concerned i^{th} input;

P_{xi} = Per unit price of the relevant i^{th} input;

TFC = Total fixed cost involved in production process;

$i = 1, 2, 3, \dots, n$ (Number of inputs)

Statistical methods such as means, percentages, standard deviations, and frequencies were used to describe the selected characteristics of the respondents. Economic analyses, including the calculation of the Benefit-Cost Ratio (BCR), gross margin, and marginal benefit-cost ratio, were performed to assess the profitability of rice seed production.

Results and Discussion

Production cost of Tulshimala rice

Rice cultivation, particularly the production of aromatic rice varieties, has been a topic of significant interest in agronomic and economic studies due to its high market value and cultural importance in countries like Bangladesh and India. Several studies have explored the profitability of rice production, focusing on factors such as input costs, yield, and market challenges. According to Anik and Talukder (2002) rice farmers in Bangladesh face a wide range of obstacles, from labor shortages to high production costs, which influence their profitability. Similarly, Moon *et al.*, (2020) have documented that while aromatic rice varieties command higher market prices, their production involves higher costs due to increased labor and input demands. Studies like those of Md. *et al.*, (2017) and Md. *et al.*, (2017) have also investigated the financial viability of aromatic rice, such as *Tulshimala*, demonstrating the impact of both variable and fixed costs on overall profitability. These findings help contextualize the results of the present study by providing a comparative framework for evaluating the production costs and profitability of *Tulshimala* rice in the Sherpur and Netrokona districts. Table 1 displays the production costs associated with *Tulshimala* rice in Sherpur and Netrokona districts of Bangladesh, categorized by input. The total production cost amounted to 92,821.00 Tk/ha which aligns with the findings of Islam *et al.*, 2017. Islam *et al.*, 2017. Notably, labor emerged as the predominant contributor, constituting 45.06% of the total production cost. The overall input costs accounted for 72.22%, with fixed costs making up the remaining 27.78% of the total production cost. Among the fixed costs, the highest proportion was attributed to the rental value of land, representing 32.99% of the total cost of production for *Tulshimala* rice.

Table 1. Cost of production of *Tulshimala* rice

Items	Sherpur	Netrokona	Average	% Share
Seedling development	2025	2075	2050	2.21
Seed	1750	1976	1863	2.01
Tillage	4631	5170	4901	5.28
Human labour	41442	42200	41821	45.06
Hired	10500	11000	10750	11.58
Family	6500	6500	6500	7.00
Hired contract (transplanting and harvesting)	24442	24700	24571	26.47
Fertilizer cost	5250	6120	5685	6.12
Irrigation	2950	1850	2400	2.59
Herbicide	901	988	944	1.02
Pesticides	3473	2470	2972	3.20
Power thresher	3859	4940	4400	4.74
Total variable cost	66282	67789	67035	72.22
Interest on operating capital	1705	1711	1708	1.84
Rental change of own land	24443	23712	24077	25.94
Total fixed cost	26148	25423	25785	27.78
Total cost	92429	93212	92821	100.00

Note: Here, 247 decimals = 1 hectare, data source: Field Survey of 2018-2019

Table 2. Per hectare profitability of *Tulshimala* rice in Sherpur and Netrokona Districts

Items	Sherpur	Netrokona	Average
Total costs (BDT/ha)	92,429.00	93,212.04	92,820.52
Total variable costs (BDT/ha)	66,281.58	67,788.80	67,035.19
Total fixed cost (BDT/ha)	26,148.00	26,021.47	26,084.74
Yield (kg/ha)	2,750.00	2,710.00	2730.00
Market value of paddy (BDT/ha)	115,500.00	116,530.00	116,015.00
Market value of straw (BDT/ha)	14,250.00	13,550.00	13,900.00
Gross benefit (BDT/ha)	129,750.00	130,080.00	129,915.00
Gross margin (BDT/ha)	63,468.42	62,291.20	62,879.81
Net return (BDT/ha)	37,321.00	36,867.96	37,094.48
Unit price of grain (BDT/kg)	42.00	43.00	42.50
Unit cost of production (BDT/kg)	33.61	34.40	34.00
BCR (cash cost basis) (Undiscounted)	1.96	1.92	1.94
BCR (full cost basis) (Undiscounted)	1.40	1.40	1.40

Source: Field Survey of 2018-2019

Profitability

From the perspective of farmers, rice production must offer financial rewards that are competitive with the financial returns from other crop and non-crop ventures (Anik and Talukder, 2002). The yield of *Tulshimala* rice stood at 2,750.00 kg/ha, resulting in a gross return of 129,915.00 Tk/ha (Table 2). This finding also aligns with the result of (Md. *et al.*, 2017; Moon *et al.*, 2020). This return was composed of 116,015.00 Tk/ha from paddy and 13,900.00 Tk/ha from byproducts (straw). The BCR calculated on both full cost and current cost bases was 1.40 and 1.94, respectively which is similar to (Ara *et al.*, 2015). This

indicates that the current return on investment in *Tulshimala* rice production is 194 percent. The unit cost of production and return from the grain of *Tulshimala* rice were 34.00 and 42.00 Tk/kg, respectively. In essence, farmers are realizing a benefit of 8.50 Tk/kg through the production of *Tulshimala* rice.

Producers' challenges

Table 3 outlines the challenges expressed by respondents concerning the production of aromatic rice. The primary impediments related to the cultivation of aromatic rice were the prevalent and severe infestations of neck blast and sheath rot diseases, identified by 95% of the respondent farmers as the most significant constraints. Other notable challenges included a labor shortage during transplanting and harvesting periods (85%), the elevated cost of pesticides and insecticides (80.66%), and issues such as inadequate storage, fluctuating prices, and challenges in capital formation, all contributing to considerable constraints in *Tulshimala* rice production within the study area. These problems are similar to the problems found by John and Fielding, 2014.

Table 3. Marketing and institutional problems of farmers in the study areas

Sl No.	Description of the Problems	Percentage (%)
A	Production and Marketing aspect	
1	Neck blast and sheath rot diseases	95.0
2	Labor crisis on transplanting and harvesting period	85.0
3	Lodging problems	83.0
4	High price of pesticide and insecticide	80.8
5	Problem of price setting	75.0
6	Problem of storage facilities	62.5
7	Lack of market	52.0
B	Financial and Institutional aspect	
1	Loan repayment problem	33.3
2	Lack of capital availability	45.8
3	Problems of credit facility	41.6
4	Transport problem	20.8
5	Lack of institutional support	37.5
6	Problem of theft	16.7
7	Problems of excess water (flooding)	8.3

Source: Field Survey of 2017-2018

Demand of farmers toward profitable Tulshimala rice production

Farmers cultivating *Tulshimala* rice in Bangladesh, particularly in the Sherpur and Netrokona districts, express a clear demand for improvements that would enhance the profitability of their production. Key among these demands is the availability of affordable labor, as labor shortages during critical periods such as transplanting and harvesting significantly affect production efficiency. Additionally, farmers seek better access to affordable and effective pest and disease management solutions, particularly to combat widespread issues like neck blast and sheath rot, which threaten both yield and quality. Farmers also emphasize the need for better access to credit and capital, which would allow them to invest in necessary inputs, such as high-quality seeds, fertilizers, and advanced farming technologies, without facing financial strain.

Conclusion

In summary, the study unveiled that the total production cost of *Tulshimala* rice amounted to 92,821.00 Tk/ha. The Benefit Cost Ratio (BCR) stood at 1.40 on a full cost basis and increased to 1.94 on a current cost basis. The study identified significant constraints in the production of aromatic rice in Bangladesh, including the unavailability of labor, pest and disease problems, high labor costs, and lodging. Furthermore, there is a growing demand for strengthened market linkages that would improve both domestic and international trade opportunities for *Tulshimala* rice, helping farmers capitalize on its aromatic quality and premium pricing. Meeting these demands through policy support and infrastructure development could significantly improve the profitability and sustainability of *Tulshimala* rice production. Addressing these challenges through strategic planning and government intervention in both production and marketing aspects could foster an environment conducive to improved aromatic rice production in Bangladesh.

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