



Economics of Green Leaf Cultivation of Small Tea Growers in Some Selected Areas of Panchagarh District

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ABSTRACT

The present study was conducted to assess the profitability and constraints of green leaf cultivation of small tea growers in Panchagarh district. Descriptive statistics was used to achieve the objective of the study. Simple random sampling method was used to collect data from 50 small tea growers through direct interviewing. The study showed that on an average per kilogram cost of green leaf was Tk.12.15 and Tk.12.86 on the basis variable and fixed cost basis respectively. The average per kilogram gross margin of green leaf was found to be Tk.19.85. But on the other hand on an average, per kilogram net benefit of green was Tk.19.14. The benefit cost ratio was 2.49 indicating that 1 taka investment resulted in a benefit of Tk.1.49. The constraint of green leaf cultivation among the small farmers were lacking of knowledge in plucking, inappropriate application of fertilizer and improper knowledge in pruning and techniques in cultivation. The cultivation of green leaf among small farmers in Panchagarh district was profitable. Therefore, to overcome the constraints it is necessary to improve the knowledge of farmers for tea cultivation through intervention and by organizing training on fertilizer use and access to Bangladesh Tea research Institute advisory services regarding tea cultivation practices.

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Introduction

Tea is a popular beverage made from the leaves of an evergreen shrub or tree *Camellia sinensis*, family Theaceae. It is predominantly an export-oriented evergreen crop in Bangladesh and a perennial crop grown as a monoculture on large contiguous areas. Tea cultivation in Bangladesh was originated in Malnicherra of greater Sylhet in 1854. Since inception, tea cultivation has extended to greater Sylhet and Chattogram. Presently, Bangladesh has 166 tea estates covering a total area of 1,16,219 hectares of land out of which 61,579 hectares of land are cultivated with tea in greater Sylhet and Chattogram. The annual

tea production is 82.13 million Kg with average yield 1529 kg/ha which is low as compared to other leading tea producing countries (Banglapedia, 2015). About 0.15 million people are directly employed in the tea industry. Many more people are indirectly employed in other sectors related to tea processing and business. Tea is one of the most important plantation crops, with a financially viable life span of not less than 60 years.

It is also a major foreign currency earning Bangladesh which gives the tea industry a noteworthy place in the country's economy as an earner of foreign currency earning Bangladesh (Mukhopadhyay and Mondal, 2017). Bangladesh is facing a major challenge due to rise of domestic tea consumption and global competitive market. Presently, Bangladesh is producing 1.89% of world tea production. Export of tea has been declining due to lack of exportable surplus (Saha *et al.*, 2020). Gradually, the country is losing its export market due to increasing internal demand for tea consumption. In order to extend our export market, Bangladesh has to increase tea production by bringing more areas under tea cultivation. Tea is an agro-based labor intensive and export oriented industry. Tea plays an important role in the national economy by generating employment opportunities, export earnings and cheapest health drink for our people (BTB, 2014). Bangladesh is one of the small tea producing countries in the world and our share of global production and export is not significant (Saha *et al.*, 2020). As a whole, in Bangladesh, total cultivated lands of tea are 59,026 hectares out of which 49684 hectares in greater Sylhet, 5821 hectares in greater Chattogram and 3521 hectares in northern district (BTA, 2014). These areas of production are not sufficient to meet up the internal demand of the country. Statistics appears that tea consumption increases @ 323%, whereas tea production increases @ 1.89% per year (Saha *et al.*, 2020).

It is also noted almost tea suitable areas in greater Sylhet and greater Chattogram has been saturated by tea cultivation. The major tea producing countries of the world such as China, India, Srilanka, Kenya, Indonesia etc. were involved in tea cultivation through established large tea estates. Besides, recently yet they have been involved in tea extension through small holding tea cultivation with a view to increase tea production in their countries. Like other tea producing countries if we utilize cultivable land lying vacant in the existing tea garden in greater Sylhet and Chattogram more production will be earned which fulfill internal demand of the country. Besides, we will have to earn valuable foreign exchange by exporting surplus tea in foreign countries (Saha, 2012). In order to meet the export and internal demand of Bangladesh the thriving tea sector is boosting the economy of the Sub-Himalayan Panchagarh district, bringing solvency to many farmers as well as farm-workers, improving their life standard and livelihoods (BSS, 2018).

Beginning of 2000, small, marginal and large farmers and investors are showing interests in tea farming on the plain land in the Sub-Himalayan district as a cash crop. Currently, tea is being cultivated on 3515 hectares of land, including 30,76 hectares in Panchagarh (The Financial Express, 2018). In a recent feasibility study undertaken by the Bangladesh Tea Board it appears that about 6,000 ha land are available in three Thanas of Panchagarh district. Another 7,500 ha suitable land will be available to the settlers of Chattogram hill tracts (BTB, 2012). Topography of land, soil conditions, vegetation, temperature and rainfall in

these areas show that the land is suitable for tea cultivation. Small holding tea cultivation contributes substantially to the total production of tea in Sri Lanka, Kenya and South India. Small holding tea cultivation is coming up very fast in Assam Dooars and Terai area of India. The land is very similar to the land of Northern Bangladesh in Panchagar and Dinajpur. In order to develop small holding tea plantation, the Bangladesh Tea Board needs to establish strong extension and development services through its Development Unit Research and extension center to be set up in the proposed areas. Beginning of 2000, small, marginal and bigger farmers and investors are showing interest in tea farming on the plain land in the sub-Himalayan district as a cash crop (BTB, 2019).

The increase in yield of a crop is considered as an indicator of progress and achievement. Increase in output may be achieved through increased area allocations from alternative uses and /or through yield increases. The Bangladesh Tea Industry has attained its extensive margin of cultivation of land and there is practically no enough additional land to be brought under new cultivation. This is more imperative in a land scarce situation like Bangladesh, where its average yield lags behind its neighboring countries with comparable environmental and physical resources. The average yield of Bangladesh tea is low (1529 kg/ha) compared with Kenya (2182 kg/ha), India (2126 kg/ha) and Srilanka (1798 kg/ha) (ITC, 2017). This is obvious that production of tea in the country will have to increase every year to keep pace with the increased per capita consumption at least to keep the export quantity static. A large tea area is under seedlings where in absolute term clonal yield levels have been much higher than the seedling types. Of the total tea area, only 41% were clonal variety (Boonerjee, 2016). The scope for increasing tea is enormous because the bulk of the tea area is yet now under traditional variety.

As an agro-industry, economic research on tea should be carried out from the very beginning of the establishment of tea estates. Keeping this view in mind, the Bangladesh tea research institute started research on tea economics since 1991. Saha *et al.* (2007) carried out a study on "Cost of production of tea in selected areas of Bangladesh". The average per kilogram cost of made tea was Tk. 54.40. The average per kilogram cost of made tea was the highest (Tk. 62.69 Kg⁻¹) at U class while it was the lowest (Tk. 53.07 Kg⁻¹) at A class. Cost of production decreased with an increase in production. The average per Kg cost of made tea in greater Sylhet and greater Chattogram was Tk. 52.47 and Tk. 59.13, respectively. The average per Kg cost of made tea was the highest in greater Chattogram irrespective of type of managements and classes. The average per Kg cost of made tea was the highest (Tk. 57.67 Kg⁻¹) at proprietary tea estates while it was the lowest (Tk. 47.91 Kg⁻¹) at BTB managed tea estates.

Saha *et al.* (2012) was undertaken a study to find out the cost of production and economic profitability of made tea cultivation in Bangladesh. The study showed that on an average per kilogram and per hectare cost of made tea were Tk. 63.42 and Tk. 87886 respectively. The highest cost component was the labour wage constitutes 22.60% followed, by tea manufacturing 22.39%. The average per kilogram and per hectare gross margin of Bangladesh tea were Tk. 49.79 and Tk. 69023. The gross margin as well as the benefit cost ratio was found to be higher at Sylhet valley circle compared with the Chattogram valley circle. Saha *et*

al. (2011) conducted a study on “Cost of production of green leaf in some selected small tea growers of Bangladesh”. They found that on an average per kilogram cost of green of small farmer was found to be Tk. 10.16 and Tk. 12.65 on the basis of variable and fixed cost basis respectively. On an average, the expenditure was the highest for labour wage Tk. 4.15 and was the lowest Tk. 0.73 for chemicals. Cost of labor wage was the major cost items constituting 40.85% of the total cost. Among the labor cost, the highest cost was incurred in plucking (44.33%) followed by weeding (28.68%). The second major cost was incurred in overhead accounting for 18.60% of the total cost.

The cost of production of a commodity plays an important role in the economy of farmers. It regulates and also indicates the growth of an industry. It furnishes the real base for making a policy decision. It is also an important parameter to determine the economic profitability of the farmer.

The aim of analyzing costs and returns is to determine the amount of profit of a farmer is to making from a particular commodity production within the given technology and investment. The profitability of a commodity production depends on its prices, cost of production and available technology. However, there are very few studies were found in tea in Panchagarh district. And the very rare research was founded on concentrating on economic profitability of small tea farmers. In addition, this study just focused only on small farmers, which were not found in any other study. Hence, the proposed study is expected to generate a number of vital information useful for the planters as well as policy planners to guide the tea industry in Panchagarh district which is at present indispensable for the overall development of the tea industry as well as earning of foreign currency for the country. Therefore, the specific objectives of this study are: i. to assess the profitability of green leaf tea production, ii. to find out the constraint which affect the production of green leaf cultivation and iii.to draw policy recommendation for the development of green leaf cultivation in Panchagarh district.

Methodology

The present study was based on primary data collected through face to face interview by using the structured interview schedule. A total of 50 small tea growers were selected using simple random sampling from the villages Autaria, Bhajanpur and Tetulia of Panchagarh district during the year 2018-19. The villages were selected due to intensive cultivation of tea in that particular area. Data were collected from the farmers whose cultivated area was from 0.50 acres to 2.49 acres of land (BBS, 2019). The farmers in the study area planted clonal variety of Bangladesh Tea variety 2 (BT2), and Tocklai Variety 29 and 30 (TV29 and TV30).Both tabular and descriptive statistics were used to analyze the collected data. To calculate the economical performance of green leaf cultivation of small tea growers descriptive statistics such as the average, percentage and profit equation was used in this study.

Gross Return

$$GR_i = \sum_{i=1}^n Q_i P_i$$

Where, GR_i = Gross Return from i^{th} product (Tk. ha⁻¹)

Q_i = Quantity of the i^{th} product (kg)

P_i = Average price of the i^{th} product (Tk.)

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

Gross margin

Gross margin was calculated among the difference between gross return and total variable costs. That is, $GM = GR - TVC$ Where, GM = Gross margin, GR = Gross Return, TVC = Total variable cost.

Profit Equation

To determine the profitability of green leaf cultivation, every cost and return items were included. The profit was calculated by the following formula, $\Pi = GR - TC$

Where, Π = profit; GR = Gross return; TC = Total cost. TC is the summation of the total variable cost and total fixed cost.

Benefit Cost Ratio (BCR)

The BCR is a relative measure, which is used to compare benefit per unit of cost. The BCR was estimated as a ratio of gross returns and gross costs. The formula calculating BCR (undiscounted) was as such: Benefit Cost Ratio = Gross benefit / Gross cost.

Result and Discussion

The cost incurred for the use of different inputs in green leaf production among the sampled small growers was calculated on the basis of per unit area and output return obtained. The study showed that on average, per kilogram variable and fixed cost of green leaf cultivation of small farmers in Panchagarh was observed to be Tk. 12.15 and Tk. 12.86 respectively (Table 1). Percentage of different items of cost to total the cost of production of green leaf cultivation is shown in Table 2. On an average the cost of production was found to be the highest in labor wage constituting 51.36% followed by manures and fertilizers 32.18%, establishment 11.77%, chemicals and pesticides 3.70% and overhead 0.99% respectively. On the other hand, among the labor cost, the highest cost was incurred in plucking (28.40 %) followed by weeding (6.83%). The gross margin of green leaf was tk.19.85 kg⁻¹.

The net profit of cultivation of green leaf tea was Tk. 19.14 per kilogram in the study area. The study also showed that the per kilogram benefit cost ratio of green leaf cultivation was 2.49 which implied that small farmer in the study area could earn Tk. 2.49 with the investment of one taka. The rate of return (BCR) over total cost was higher and the estimated return was positive indicates that tea cultivation of small farmers was profitable in Panchagarh district.

Table 1 Profitability analysis of green leaf cultivation of small farmers in Panchagarh district (Tk./kg)

Cost Parameter	Small Farm
A. Variable Cost Basis	
1. Labour Wage (Tk./kg)	6.24
i. Pruning	0.28
ii. Infilling	0.09
iii. Weeding	0.83
iv. Maintenance of Roads and Bridges	0.13
v. Manuring and Fertilizing	0.27
vi. Application of pesticides and insecticides	0.40
vii. Irrigation	0.34
viii. Plucking	3.45
ix. Carrying	0.45
2. Manures and Fertilizer (Tk./kg)	3.91
i. Manures	2.78
ii. Chemical Fertilizers	1.13
3. Insecticides, Pesticides and Weedicides (Tk./kg)	0.45
4. Establishment(Tk./kg)	1.43
5. Overheads(Tk./kg)	0.12
i. Fuel for irrigation	0.10
ii. Land revenue	0.02
	Sub-total
	12.15
B. Fixed Cost basis(Tk./kg)	
i. Opportunity cost of land	0.60
ii. Plucking materials	0.03
iii. Irrigation	0.05
iv. Spray machine	0.03
	Sub-total
	0.71
Total Cost (Tk./kg)	12.86
Profitability Analysis	
i. Yield	1.00
ii. Price	32.00
iii. Gross Return (Tk./kg)	32.00
iv. Gross Margin (Tk./kg)	19.85
v. Net Profit (Tk./kg)	19.14
vi. Benefit-cost ratio (undiscounted)	2.49

Source: Author's estimation

Table 2 Cost components as proportion to total cost (in percent) in small farm in Panchagarh district

Cost Parameter	Small Farm
A. Variable Cost Basis	
1. Labour Wage	51.36
i. Pruning	2.06
ii. Infilling	0.75
iii. Weeding	6.83
iv. Maintenance of Roads and Bridges	1.07
v. Manuring and Fertilizing	2.22
vi. Application of pesticides and insecticides	3.29
vii. Irrigation	2.80
viii. Plucking	28.40
ix. Carrying	3.70
2. Manures and	32.18
i. Manures	22.88
ii. Chemical Fertilizers	9.30
3. Insecticides, Pesticides and Weedicides	3.70
4. Establishment	11.77
5. Overheads	0.99
i. Fuel for irrigation	0.82
ii. Land revenue	0.17
Total	100

Source: Author's estimation

Agricultural activities face several kinds of constraints. Likewise, tea cultivation in Panchagarh district is not away from constraints. Tea production in the study areas faces some kind of constraints. The 3 represents that 100% farmers did not have proper knowledge for plucking tea leaves in the study area which ranked first. They plucked more than 4 leaves and a bud with sickles instead of hand, which create more fiber in processing house during preparation of making tea and produce wastage as well as deteriorate the quality of drinkable tea. As a result, farmers were getting low prices compared to other tea estates in the auction market. Ninety eight percent farmers responded that they faced the problem of pruning and that's why this problem was ranked second. The farmer's knowledge on height level of pruning was inadequate. Moreover, farmers were using overdoses of fertilizers as compared with recommended doses of BTRI for tea production which ultimately increased cost of production of tea cultivation. Farmers also have lack of technical knowledge about tea cultivation and its production practices. On an average 65% farmers opined that they had no technical knowledge for tea cultivation.

Table 3 Constraints in tea cultivation for farmers

Constraints in tea cultivation	Yes (%)	No (%)	Rank
Lack of knowledge and improper knowledge in plucking	100	0	1
Improper knowledge and practice of pruning	98	2	2
Improper application of fertilizer	90	10	3
Lack of technical knowledge for tea cultivation	65	35	4

Source: Author's estimation

Conclusion

The current situation of tea production in Panchagarh district is profitable. Farmers established their tea field for their source of income earned as well as to produce quality tea. But in the study area, farmers used over doses of chemical fertilizer than the recommended doses of BTRI and did not follow the proper plucking practices Tea was labor intensive at Panchagarh and the benefit cost ratio (BCR) indicated that tea cultivation was profitable despite of having some constraints. The most important point is to maintain quality awareness of plucking among the growers. The essential practices for maintaining fine leaf and the health of the bush and its economics are to be explained so that quality augmentation programs should be implemented in the field. The lack of technical knowledge and absence of scientific cultural practices of tea cultivation has been observed to be the highest constraints against productivity improvement in the small growers' plantations. Therefore, the need of intervention is necessary and can be done by arranging training program for improvement of skill and knowledge in cultivation of tea and in cost management in the field. Even, the respected authorities like Bangladesh Tea Board , Bangladesh Tea Research institute or non-government organizations can manage advisory services for farmers to improve the knowledge of farmers in terms of cultivation practices and related operations so that farmers can maintain profitable tea production over time in Panchagarh.

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