Original Research Article

Financial analysis of country bean in Narsingdi district of Bangladesh

ABSTRACT

Aims: The study is an attempt to examine the profitability, problems and probable solutions of country bean production in the Belabo upazila of Narsingdi district, Bangladesh.
Study design: Financial calculation of the cost and return were done to the evaluation process. Besides this problems and solutions of bean cultivation were also analyzed.
Place and Duration of Study: This study was conducted in Belabo upazila of Narsingdi district of Bangladesh from November 2019 to April 2020.
Methodology: A convenience sampling technique was selected to meet the objectives. One hundred and twenty five country bean growers were chosen from the study area. An interview schedule was prepared for collecting necessary data from the participants. The schedule contained questions about the socioeconomic characteristics of farmers, different costs associated with production, and different problems faced by them during production and their probable suggestions to overcome them. Standard financial techniques were used to evaluate costs and returns. Descriptive statistics were used to describe socio-demographic characteristics, farming information, problems during the production process, and rank of suggestions.
Results: The study found that the total cost of bean cultivation in Bangladeshi Taka (BDT) was found 163866.35 per ha, net return was BDT 60850.28 per ha and benefit cost ratio was 1.37. The study found low price, lack of scientific knowledge in farming, transportation problems, and poor storage facilities as major constraints. Besides, the farmers mentioned that they need proper training, reduction in price risk, credit support, cold storage facilities, and transportation facilities.
Conclusion: The study showed that per hectare yield, gross returns, gross margin, net return and benefit cost ratio of bean were higher. Therefore, bean production is highly profitable and it would help to improve the socioeconomic condition of farmers in Narsingdi district. Besides, the study identified several problems faced by the bean growers and possible solutions to overcome the constraints are proposed.

Keywords: Profitability, bean, vegetables, problems, suggestions

ABBREVIATIONS

Hg/ha: Hectogramme/hectare, BCR: Benefit Cost Ratio, TSP: Tripple Super Phosphate, MoP: Murate of Potash, BDT: Bangladeshi Taka, Tk: Taka,

1. INTRODUCTION

Bangladesh is an agriculture based country. The growth and stability of the economy depends largely on the growth of agriculture. In 2019, the share of agriculture in Bangladesh's gross domestic product was 12.68 percent and employment in agriculture (% of total employment) (modeled ILO estimate) in Bangladesh was reported at 37.75 percent in [1] [2]. The agriculture sector comprises crops, livestock, forestry, and fisheries while approximately 8.99 percent of the GDP was derived from crops and horticulture [1]. Out of the total 13.3 million hectares of arable land in the country, only 6.73 percent is under horticultural crop. If potato and spices are excluded, the area comes down to 3.22 percent only [3]. But nowadays commercial production of vegetables is becoming popular among some farmers. Among the vegetables beans are important parts. They come in a variety of sizes, colors, forms and they are incredibly useful because they can be dried and preserved for years. Country bean (*Lablab purpureus*) is one of the most important leguminous vegetables in Bangladesh and is normally grown during the *rabi* or winter season. Beans are delicious and can enrich soil fertility. Beans contain calories 131.98 (k cal/100 g), carbohydrates 23.72 g, protein 8.84 g, fat 0.52 g, vitamins 6.86 mg, mineral 596.99 mg, water 65.7 g per 100 g of beans [4]. The beans have the lowest content in fats, oils and sugars. Most beans contain only 2-3 percent fat. They are the perfect food for a fat-restricted diet. It contains no cholesterol, and they can help lower your cholesterol level because they are one of the richest sources of fiber. In Bangladesh beans are cultivated in about 69013 ha yielding 144050 metric tons [1]. A large number of farmers in Narsingdi district are now engaged in commercial bean cultivation as profitable farming has changed the lives of many people in the region. In Bangladesh, 20594 hectares of land were used to cultivate bean in 2018 and 20873 hectare in 2019. Average yield of bean was 65485 hg/ha in 2018 and 69013 hg/ha in 2019. Total production in 2018 was 134860 tons and it becomes 144050 in 2019 [5]. The data of FAO about bean cultivation indicates that the yield, production and area of cultivation is increasing every year in Bangladesh.

Table 1. Status of bean cultivation in Bangladesh.

Particular	Unit	2015	2016	2017	2018	2019
Area harvested	ha	19907	20211	20880	20594	20873
Yield	hg/ha	61331	63666	65850	65485	69013
Production	tons	122091	128676	137495	134860	144050

Source: FAO, 2019.

Chowdhuri *et al*. (2015) compared profitability of three winter vegetables among three, they found a BCR of 2.14 for country bean cultivation. Islam *et a*l. (2007) made an economic analysis on some exportable vegetables and found a 1.22 BCR for beans. Parvin (2008) found that alternative production of rice and vegetables from marginal, small, medium and large-scale farmers was profitable. Naher (2005) observed that vegetable production is more profitable and exported to other countries than other crops. Hossain (1997) has concluded that the highest gross profit per hectare has been achieved by cucumber growers, net return above full costs and cash costs, and the lowest gross profit per hectare has been obtained by cabbage growers. Haque (2001) observed that the MVP of human labor was greater than one in most vegetable production, also implying that it constituted a very

important factor and there prevails a great chance to generate employment. However, there are few studies in Bangladesh on vegetable production (Khan et al., 2009; Hoq et al., 2012; Hasan et al., 2007; Mamun et al., 2010; Hasan et al., 2014), but no one has focused on the profitability, problems and possible solutions to solve those barrier of bean growers [6, 7, 8, 9, 10]. With this backdrop, the current study was carried out in Narsingdi district with the following objectives:

1. To study the socioeconomic characteristics of the country bean growers
2. To determine the profitability of country bean production
3. To identify the problems in bean production and formulate suggestions

2. METHODOLOGY

The study was conducted in Belabo upazila of Narsingdi district, Bangladesh. A convenience sampling technique was selected to meet the objectives. One hundred and twenty five country bean growers were selected from the study area. For conducting the study data were collected through an interview schedule prepared by the researcher. The questionnaire included questions about the socioeconomic characteristics of the farmers, different costs associated with production and post-harvest activities with till selling the produce. To get the desired information direct questions and different scales were included in the questionnaire. Relevant data were collected from the selected samples through face to face interview. In addition to primary data, secondary data were also collected from various publication like journals, different organization like Department of Agricultural Marketing of Bangladesh and website searching. Information was collected initially in local units. After checking them these were converted into quantitative form by using suitable scoring. Necessary tables were prepared by summarizing the data. The collected data were analyzed according to the objectives of the study. Inconsistencies in the data were removed.

2.1 Profitability analysis

The net return of country bean was estimated using the set of financial prices. The financial prices were market prices actually received by farmers for outputs and paid for purchased inputs during the period under consideration in this study. The cost items identified for the study were as follows:

i. Land preparation
ii. Human labor
iii. Seedlings
iv. Urea
v. TSP
vi. MoP
vii. Insecticide
viii. Irrigation
ix. Interest on operating capital
x. Land use cost

The returns from the crops were estimated based on the value of main products. In this study variable cost, fixed cost and total cost had been described. Total variable cost (TVC) included land preparation, human labor, seedlings, organic manure, urea, TSP, MoP, insecticides, irrigation and interest on operating capital. Fixed cost (FC) included only rental value of land. Total cost (TC) included total variable cost and fixed cost.

Interest on operating capital: Hence, at the rate of 9 percent per annum interest on operating capital for four months was computed for country bean. Interest on operating capital was calculated by using the following formula:

IOC= AIit
Where,
IOC= Interest on operating capital
i= Rate of interest
AI= Total investment / 2
t = Total time period of a cycle

Land use costs: Land use cost was calculated on the basis of opportunity cost of the use of land per hectare for the cropping period of four months. So, cash rental value of land has been used for cost of land use.

Gross return: Per hectare gross return was calculated by multiplying the total amount of product and by-product by their respective per unit prices. **Gross return**= Quantity of the product * Average price of the product + Value of by- product.

Gross margin: Per hectare gross margin was obtained by subtracting variable costs from gross return. That is, **Gross margin** = Gross return – Variable cost

Net return: Net return or profit was calculated by deducting the total production cost from the total return or gross return. That is, **Net return** = Total return – Total production cost.

Undiscounted Benefit Cost ratio (BCR)

Average return to each taka spent on production is an important criterion for measuring profitability. Undiscounted BCR was estimated as the ratio of total return to total cost per hectare. **BCR** = Total return (Gross return)/ Total cost

Descriptive statistics (frequencies and percentage) were used to describe socio-demographic characteristics, farming information, problems during of production process, and rank suggestions.

3. RESULTS AND DISCUSSION

3.1. Socio-demographic Status of Respondents

The magnitudes of socio-demographic profile of the respondents are illustrated in Table 2. Most respondents were married (94.4%). Farmers having a family size of 1 to 4 members represented 40%, family size of 5 to 7 members was 36% and family size above 7 members was 24%. There was no institutional education for 31.2% of respondents, but 46.4% respondents had primary level education and only 22.4% had secondary and above level education. In the case of average monthly income, the majority of the respondents (36%) earned from BDT 20000 to 30000 per month. About half of farmers in the sample are dependent on agriculture and allied activities for their income whereas, and 20% of farmers rely on only agriculture as their earning source.

Table 2. Socio-demographic profile of country bean growers in Belabo upazila of Narsingdi district, Bangladesh.

Variables	Frequency	Percentage
Marital status		
Single	7	5.6
Married	118	94.4
Family size		
1 to 4	50	40.0
5 to 7	45	36.0
More than 7	30	24.0
Household head's education		
No institutional education	39	31.2
Primary	58	46.4
Secondary+	28	22.4
Average monthly income		
less than 20000	32	25.6
20000 to 30000	45	36.0
30000 to 40000	31	24.8
more than 40000	17	13.6
Major income source		
Agriculture	25	20.0
Agriculture and allied activities	62	49.6
Others	38	30.4

3.2. Farming information of farmer

The number of respondents with a land size of 'below 1 acre',' 1 to 3 acres' and 'more than 3 acres' were 34.4%, 58.4%, and 7.2 % respectively. The highest portion of bean farmers (38.4%) had a farming experience of 9 - 10 years. In the case of labor usage, 81.6% of respondents used both own and hired labor in their farming activities. Most respondents (80.8%) carry out organic growing practices, but not certified, whereas 19.2% of the respondents were practicing conventional method for growing. The majority of the farmers (88.8%) had not any storage place for their crops and only 11.2% of farmers had those facilities. Table 3 illustrates that 30.4% of the farmers had access to training or technical knowledge about modern agriculture.

Table 3. Farming information of country bean growers in Belabo upazila of Narsingdi district, Bangladesh.

Variables	Frequency	Percent
Size of land holdings		
Below 1 acre	43	34.4
1-3 acres	73	58.4
Above 3 acres	9	7.2
No of years engaged in farming		
Less than 7 years	11	8.8
7-8 years	42	33.6

9-10 years	48	38.4
Above 10 years	24	19.2
Labor use		
Hired	8	6.4
Owned	15	12.0
Both hired and owned	102	81.6
Having storage place for crops		
Yes	14	11.2
No	111	88.8
Any training or technical knowledge		
Yes	38	30.4
No	87	69.6

3.3. Costs associated with cultivation

The total variable cost of bean production was BDT 151528.31 and total fixed cost was BDT 12338.04 per hectare (Table 4).

Table 4. Total variable cost and fixed cost of country bean in Belabo upazila of Narsingdi district, Bangladesh (in Bangladeshi Taka).

Items		**Taka/ha**	**Percentage of TVC**
Seed cost		8408.33	5.55
Labor cost		63735.37	42.06
Land preparation cost		13322.08	8.79
Irrigation cost		14546.22	9.60
Fertilizer cost	Urea	12526.75	8.27
	TSP	9202.17	6.07
	MOP	1415.00	0.93
	DAP	2201.02	1.45
	Manure	1331.35	0.88
Pesticides cost		10390.00	6.86
Other cost		14450.00	9.54
A.Total variable cost		151528.31	100
Land use cost		7500.00	60.79
Interest on operating capital @ 9%		4838.04	39.21
B. Total Fixed cost		12338.04	100

3.4. Gross return

Average yield of bean per hectare was found to be 10480.86 kg and the average price of bean was BDT 20.25. Therefore, the gross return of main product was BDT. 212216.63 per hectare and the estimated value of by-product was BDT 12500 per hectare. Here the by-products were fence, bamboo which were used to made stage. Therefore, total gross return was BDT 224716.63 for per hectare (Table 5).

Table 5. Estimation of gross return of country bean in Belabo upazila of Narsingdi district, Bangladesh (in Bangladeshi Taka).

Cost Items	Quantity	Price Per Unit (Tk.)	Costs/Returns (Tk/ha)
Main product	10480.86	20.25	212216.63
By-product			12500
C. Gross return			224716.63

3.5. Net return and BCR

On the basis of the data, gross margin was found to be BDT 73188.04 per hectare and the net return was estimated as BDT 60850.28 per hectare. Benefit Cost Ratio (BCR) was found to be 1.371 which implies that the investment of one taka in country bean production generated BDT 1.371. From the above calculation it was found that bean cultivation is profitable in Bangladesh (Table 6).

Table 6. Net return and BCR of country bean in Belabo upazila of Narsingdi district, Bangladesh (in BDT).

Item	Cost/Returns (Tk./ha)
A. Total variable cost	151528.31
B. Total fixed cost	12338.04
C. Gross return	224716.63
D. Total cost(A+B)	163866.35
E. Gross margin (C-A)	73188.04
F. Net return (C-D)	60850.28
G. Undiscounted BCR (C/D)	**1.37134**

3.6. Problems of country bean cropping

Most respondents complaint on getting a low price for their produce, among them 47.2% noted this as their worst problem. About 71.2% farmers faced high cost of irrigation water and 76.0% farmers mentioned a high price for quality seed and fertilizers. The bean producers of Narsingdi suffered from lack of quality seed (85.6%). The farmer also faced pest and disease problem (63.2%), inadequate extension service (73.6%), lack of scientific knowledge (85.6%). For 43.2% of the respondents, lack of transportation was the worst problem, whereas 41.6% mentioned it as problem. Lack of storage facilities was an important constraint mentioned as worst problem by 48.8% and as a problem by 36% of the respondents (Table 7).

Table 7. Problems faced by country bean farmers in Belabo upazila of Narsingdi district, Bangladesh ((n (%)).

Problems	Worst Problem	Problem	No problem at all
Poor storage facilities	61(48.8)	45(36.0)	19(15.2)
Lack of scientific knowledge of farming	59(47.2)	48(38.4)	18(14.4)
Low price of produce	59(47.2)	28(38.4)	18(14.4)
Lack of transportation facilities	54(43.2)	52(41.6)	19(15.2)
Lack of quality seed	50(40.0)	57(45.6)	18(14.4)
Inadequate extension service	35(28.0)	57(45.6)	33(26.4)
High price of quality seed and fertilizers	25(20.0)	70(56.0)	30(24.0)
Attack of pest and disease	25(20.0)	54(43.2)	46(36.8)
Lack of operating capital	25(20.0)	54(43.2)	46(36.8)
Adulteration of fertilizer, insecticide, and pesticide	16(12.8)	39(31.2)	70(56.0)
Natural calamities	15(12.0)	38(30.4)	72(57.6)
Shortage of human labor	15(12.0)	38(30.4)	72(57.6)
High cost of irrigation water	9(7.2)	80(64.0)	36(28.8)

3.7. Suggestions for solving country bean cropping problems

Table 8. shows some suggestions which were proposed and ranked by the respondents to solve the problems that occurred during bean production. In the first place, most respondents (i.e. 63 out of 125) thought that proper training is required badly (50.4%). A close proportion (49.6 %) selected also proper training in the second place. Reduction of price risk was placed in the second place of the ranking (28.8% of respondents). Most respondents mentioned easy access to credit in the third position as their main problem (42.4%). The four place was occupied by supply of adequate fertilizer, insecticide, and pesticide (42.4% of respondents). The establishment of standard cold storage took the fifth position among the main problems (49.6 of respondents). Lower in the ranking, respondents recommended solving the problem of transportation (42.4%), and supply quality seeds (60%), the supply of irrigation water (45.6%), and adequate infrastructural facilities (71.2%).

Table 8. Ranking of problems posed by country bean farmers in Belabo upazila of Narsingdi district, Bangladesh (n(%)).

Ranking of problems	1	2	3	4	5	6	7	8	9
Proper training	**63** (**50.4**)	**62** (**49.6**)	0	0	0	0	0	0	0
Reduction of price risk	62 (49.6)	**36 (28.8)**	27 (21.6)	0	0	0	0	0	0
Solve the problem of transportation	0	18 (14.4)	0	27 (21.6)	27 (21.6)	**53** (**42.4**)	0	0	0
Easy access to credit	0	9 (7.2)	**53** (**42.4**)	27 (21.6)	18 (14.4)	18 (14.4)	0	0	0
Establishment of standard cold storage	0	0	36 (28.8)	18 (14.4)	**62** (**49.6**)	9 (7.2)	0	0	0

Supply of adequate fertilizer, insecticide and pesticide	0	0	9 (7.2)	**53** (**42.4**)	0	36 (28.8)	9 (7.2)	18 (14.4)	
Supply of quality seeds	0	0	0	0	18 (14.4)		**75** (**60.0**)	32 (25.6)	0
Adequate infrastructural facilities	0	0	0	0	0	0	18 (14.4)	18 (14.4)	**89** (**71.2**)
Supply of irrigation water	0	0	0	0	0	9 (7.2)	23 (18.4)	**57** (**45.6**)	36 (28.8)

Even within the current low productivity scenario, beans production is a promising enterprise in the study area. Cost benefit analysis indicated that bean production in the study is profitable and significantly contributes to improving household nutrition, cash and employment generation. Bean production may also play a major role in reducing rural poverty. Farmers and farmers' organizations should rationally re-allocate inputs to the lowest cost input combination to further improvement in agricultural production and profitability by adopting advanced agricultural tools and new technological methods. The government should establish a large scale commercial country bean farm, through the ministry of agriculture, in order to attract young and others, to reduce the unemployment rate, which is a great problem for the country. The government should give proper attention and consideration to the training of more extension agents who will provide farmers with improved technology, especially for systematic diseases and pest control and facilities. Moreover, bean farmers should be provided with credit facilities at an affordable interest rate from formal credit institutions to boost bean production in the country. Farmers also need support for the development of associations that increase their access to key services while also enabling them to establish connections and partnerships with local businesses and traders in the private sector. However, the grower should keep the records of their operations by adopting the use of crop cards in order to get reliable information necessary to the calculation of the profitability.

4. CONCLUSION

The findings of the present study indicate that Bean production is profitable and it would help to improve the socioeconomic condition of sample farmers in the study areas. It would also help to create employment opportunities. In Bangladesh, it is difficult to increase bean production by increasing the area of land under cultivation due to the limitation of land. But, there is an opportunity to increase production of bean by improving the existing production technology. Farmers are relatively inefficient due to land fragmentation, less experience, illiteracy, etc. Besides, if the modern inputs could be made available to the farmers in time, production of this crop might be increased which could help them in alleviating rural poverty in many areas. Farmers were not known about the application of inputs in right time with right doses. Consequently, they made over or under use of some inputs. Thus, well planned management training in accordance with their problems, needs, goals and resource base can lead to viable production practices and sustainable income from bean cultivation in commercial scale.

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