

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.

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 selected from the study area. An interview schedule was prepared for collecting necessary data from the samples. The schedule contained questions about the socioeconomic characteristics of farmer, different costs associated with production, different problems faced by them during production and their probable suggestions to overcome the problems. Standard financial techniques were used to evaluate costs and returns. Descriptive statistics were used to describe socio-demographic characteristics, farming information, problems during of production process, and rank of suggestions.

Results: The study found total cost of bean cultivation in Bangladeshi Taka (BDT) was found 163866.35 per ha, net return was found BDT 60850.28 per ha and benefit cost ratio was found 1.37134. The study found low price, lack of scientific knowledge of farming, transportation problem, 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.

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]. 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 now-a-day's commercial production of vegetables is becoming popular among some of the farmers. Among the vegetables beans are important parts. They come in a variety of sizes, colors, forms and they're 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. It is delicious and can enrich soil fertility. The 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 are lowest 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 of lands with production of 144050 metric tons [1]. A large number of farmers in Narsingdi district are now engaged in commercial bean cultivation as the profitable farming has changed the lives of many people in the region.

In Bangladesh, 20594 hectare of land was 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 the year of 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 BCR 2.14 for country bean cultivation. Islam *et al.* (2007) evaluated 1.22 BCR of bean while made an economic analysis on some exportable vegetables. Parvin (2008) found that alternative production of rice and vegetables from marginal, small, medium and large-scale farmers was profitable. Naher (2005) has 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 objective:

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 and formulate suggestions

2. METHODOLOGY

The study was conducted in Belabo upazila of Narsingdi district of Bangladesh. A convenience sampling technique was selected to meet the objectives. 125 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 schedule included questions about the socioeconomic characteristics of farmer, 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 kept 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:

$IOC = Alit$

Where,

IOC= Interest on operating capital

i= Rate of interest

Al= 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 of 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. It is seen that the majority of the respondents were married (94.4%). Farmers having a family size of 1 to 4 members were 40%, family size of 5 to 7 members was 36% and family size above 7 members was 24%. The table indicates that, there was no institutional education for 31.2% of respondents, 46.4% respondents had primary level education and only 22.4% had secondary and above level education. From the table, it is also seen that in the case of average monthly income, majority of the respondents (36%) earned Bangladeshi Taka 20000 to 30000 per month. It is seen from the table that 49.6% of farmers are dependent on agriculture and allied activities for their income whereas, 20% of farmers rely on only agriculture as their earning source.

Table 2. Socio-demographic profile of Respondents

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 table shows that the highest portion of the bean farmers (38.4%) had farming experience of 9 - 10 years. The table illustrates that in the case of labor usage, 81.6% of respondents used both own and hired labor in their farming activities. The table also indicates that, 80.8% respondents growing practices were organic practice but not certified whereas 19.2% of the respondents were practicing conventional method for growing. It is seen from the table that 88.8% of farmers had not any storage place for their crops and only 11.2% of farmers had those facilities. The Table 3. illustrates that 30.4% of the farmers had access to training or technical knowledge about modern agriculture.

Table 3. Farming information

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 Bangladeshi Taka 151528.31 and total fixed cost was Bangladeshi Taka 12338.04 per hectare.

Table 4. Total variable cost and fixed cost

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

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

Table 5. Estimation of gross return

Cost Items	Quantity	Price Per Unit (Tk.)	Costs/Returns
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			(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 Bangladeshi Taka 73188.04 per hectare and the net return was estimated as Bangladeshi Taka 60850.28 per hectare. Benefit Cost Ratio (BCR) was found to be 1.371 which implies that one taka investment in country bean production generated Bangladeshi Taka 1.371. From the above calculation it was found that bean cultivation is profitable in Bangladesh. (Table 6)

Table 6. Net return and BCR

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

From the Table 7. it is seen that 85.6% of the respondents got low price of their produces, among them 47.2% mentioned that as worst problem. About 71.2% farmers faced high cost of irrigation water and 76.0% farmers mentioned price of quality seed and fertilizers is high. 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%). 43.2% of the respondents mentioned lack of transportation as worst problem whereas 41.6% mentioned it as problem. Lack of storage facilities were their important constraint which was mentioned as worst problem by 48.8% and as problem by 36% of the respondents.

Table 7. Problems faced by the farmers

Problems		Worst Problem	Problem	No problem at all
Low price of produce	N (%)	59(47.2)	28(38.4)	18(14.4)
High cost of irrigation water	N (%)	9(7.2)	80(64.0)	36(28.8)
High price of quality seed and fertilizers	N (%)	25(20.0)	70(56.0)	30(24.0)
Lack of quality seed	N (%)	50(40.0)	57(45.6)	18(14.4)
Attack of pest and disease	N (%)	25(20.0)	54(43.2)	46(36.8)
Inadequate extension service	N (%)	35(28.0)	57(45.6)	33(26.4)

Lack of operating capital	N (%)	25(20.0)	54(43.2)	46(36.8)
Natural calamities	N (%)	15(12.0)	38(30.4)	72(57.6)
Shortage of human labor	N (%)	15(12.0)	38(30.4)	72(57.6)
Lack of scientific knowledge of farming	N (%)	59(47.2)	48(38.4)	18(14.4)
Adulteration of fertilizer, insecticide, and pesticide	N (%)	16(12.8)	39(31.2)	70(56.0)
Lack of transportation facilities	N (%)	54(43.2)	52(41.6)	19(15.2)
Poor storage facilities	N (%)	61(48.8)	45(36.0)	19(15.2)

3.7 Suggestions

Table 8. shows some suggestions which were suggested and ranked by the respondents to solve the problems that occurred during bean production.

In the 1st ranking, it is seen that most of the respondents (i.e. 63 out of 125) thought that proper training is required badly and here the percentage of the respondents was 50.4%. It is seen that 49.6 percent of farmers again mentioned proper training in the 2nd ranking. As proper training was in the 1st ranking, the study placed reduction of price risk in the 2nd ranking (28.8% of respondents). In the 3rd ranking, easy access to credit was mentioned and percentage of the farmer was 42.4%. In the 4th ranking, supply of adequate fertilizer, insecticide, and pesticide was ranked where 53 out of 125 respondents (42.4%) agreed to this. Besides, the establishment of standard cold storage was in 5th ranking and the percentage of respondents was 49.6. In the 6th and 7th ranking, respondents recommended solving the problem of transportation (42.4%) and supply of quality seeds (60%) respectively. Finally, the supply of irrigation water (45.6%) and adequate infrastructural facilities (71.2%) was in the 8th and 9th ranking respectively.

Table 8. Suggestions provided by the farmers

Ranking of suggestions		1	2	3	4	5	6	7	8	9
Adequate infrastructural facilities	N (%)	0	0	0	0	0	0	18 (14.4)	18 (14.4)	89 (71.2)
Supply of irrigation water	N (%)	0	0	0	0	0	9 (7.2)	23 (18.4)	57 (45.6)	36 (28.8)
Reduction of price risk	N (%)	62 (49.6)	36 (28.8)	27 (21.6)	0	0	0	0	0	0
Easy access to credit	N (%)	0	9 (7.2)	53 (42.4)	27 (21.6)	18 (14.4)	18 (14.4)	0	0	0
Establishment of standard cold storage	N (%)	0	0	36 (28.8)	18 (14.4)	62 (49.6)	9 (7.2)	0	0	0
Proper training	N (%)	63 (50.4)	62 (49.6)	0	0	0	0	0	0	0
Solve the problem of transportation	N (%)	0	18 (14.4)	0	27 (21.6)	27 (21.6)	53 (42.4)	0	0	0

Supply of adequate fertilizer, insecticide and pesticide	N (%)	0	0	9 (7.2)	53 (42.4)	0	36 (28.8)	9 (7.2)	18 (14.4)	
Supply of quality seeds	N (%)	0	0	0	0	18 (14.4)		75 (60.0)	32 (25.6)	0

Even within the current low productivity scenario, bean 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. It also plays 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 provide with credit facilities at an affordable interest rates 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 highly 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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