Asian Journal of Agricultural Extension, Economics & Sociology

39(8): 33-39, 2021; Article no.AJAEES.71995
ISSN: 2320-7027

An Economic Analysis of French Bean(*Phaseolus vulgaris* L.) Production in Bishnupur District of Manipur

Kenjit Tongbram[1*], Y Chakrabarty Singh[1], Daya Ram[1], N. Gopimohan Singh[1], Kh. Rishikanta Singh[2] and Oinam Krishnadas Singh[3]

[1]College of Agriculture, CAU, Imphal, Manipur, India.
[2]ICAR Manipur Centre, Lamphelpat, Manipur, India.
[3]PAU, Ludhiana, Punjab, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2021/v39i830621
Editor(s):
(1) Dr. Roxana Plesa, University of Petrosani, Romania.
Reviewers:
(1) Ajagbe Adekunle David, Kogi State University, Nigeria.
(2) Issaka Zakari, Tamale Technical University, Ghana.
Complete Peer review History: https://www.sdiarticle4.com/review-history/71995

Original Research Article

Received 22 May 2021
Accepted 27 July 2021
Published 29 July 2021

ABSTRACT

The study was conducted in Bishnupur district of Manipur with an objective to work out the cost and return of French bean production. The primary data on various costs and returns were collected at random from 100 respondent farmers. Production is normally considered as the function of area and yield. Results of the cost of cultivation analysis revealed that human labour, rental value of owned land, hired machinery charges, fertilizers and plant protection chemicals were important contributors to the total cost of cultivation. The average cost of cultivation was found to be Rs. 238894 per hectare.The hired human labour charges as the major cost item, it accounted for about 41.14 per cent of the total cost of cultivation. The imputed value of family labour and rental value of owned land were the next important cost components contributing about 11.56 and 11.30 per cent of the total cost of cultivation. The net farm income per hectare was estimated at Rs.230962 and benefit cost ratios per hectare was found to be 1.96. The government and related departments should arrange training programs to upgrade the knowledge on recommended package of practices on

**Corresponding author: E-mail: kenjittongbram@gmail.com;*

cultivation of vegetable crops and educating the farmers to develop social consciousness by strengthening local security service through proper initiatives. The farmers also need to encourage forming farmer groups or farmer producer organization (FPOs) in order to improve the production and marketing efficiency of French beans in Bishnupur district of Manipur.

Keywords: French bean; primary data; cost of cultivation; net farm income; and production.

1. INTRODUCTION

French bean (*Phaseolus vulgaris* L.) is one of the most popular and widely grown vegetables in India and belongs to the family leguminosae. It is also named as Common bean, Green bean, Dry bean, Kidney bean and Navy bean. The green immature pods are cooked and eaten as vegetable. Immature pods are marketed fresh, frozen or canned, whole, cut or French cut. The fresh pods and green leaves are used as vegetable. The antimetabolites of dry beans need removal by cooking and soaking in water**.** It is also an important pulse crop, with high yielding ability as compared to gram and pea. In the hilly region, it is grown during *kharif*and in lower hills it is sown as spring crop. In north- east regions, it is cultivated during *rabi.* It is highly sensitive to frost and water logging. The ideal temperature range for proper growth of this crop is 100-270 C. In the world, French bean is cultivated mainly in American and European countries such as America, England, Poland, Brazil, Mexico, Myanmar, China and India. In 2016, world production of green beans was 23.6 million tons, led by China with 79% of the total production. World dried bean production in 2016 was 26.8 million tons, with Myanmar, India, and Brazil as leading producers [1]. In India, more than 90 per cent of total pulse production has been the contribution of 10 states namely, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Karnataka, Andhra Pradesh, Gujarat, Jharkhand, Tamil Nadu and Telangana [2].

French bean being a traditional vegetable crop of North Eastern region, its cultivation would be a profitable enterprise. It is an added advantage that this crop is relatively less prone to pest and disease problems. French bean being a self-pollinated crop, its seed production and maintenance of its purity is much easier than other vegetable crops. Its dry seeds contain 22% proteins, 1.7% fat, 70% carbohydrates, 381 mg calcium, 425 mg phosphorus, and 12.4 mg iron per 100 gram of edible portions [3]. The green pods are rich sources of thiamine or Vitamin B1, which is critical for the proper functioning of the brain cells. Its increased production and consumption will help in supplementing the major portion of the protein requirements of vegetarian population of the country. French bean is cultivated mostly for vegetable purpose round the year except winter months (October - January). It is grown in foothills, mid and high altitude in all the northeastern states including Sikkim. Tender pods are used as vegetable and mature seeds are consumed as dal. Tripathi [4] studied the economic analysis of French bean *(Phaseolusvugaris*L.) cultivation in the rain-fed conditions of Uttar Pradesh hills. This paper examines the cost and returns of French bean cultivation at existing level of production technology in hill region of Uttar Pradesh state, India and estimates productivity of main production inputs. Data for production year 1987-88 collected from a sample of 140 farmers in 14 villages in TehriGarhwal hill region. The cost of cultivation was low in the valley than in high hills and mid hills. The use of fertilizer was either nil or very low and plant protection measures were not used, yield gross income and net return were higher in the valleys due to better soil and more favorable climatic conditions. Shelke [5] reported that the per hectare costs 'A', 'B' and 'C' of French bean cultivation at overall level were Rs. 20786.24, Rs. 29661.90 and Rs. 32718.83 respectively. The benefit-cost ratio of 1.39 at overall level indicated that French bean cultivation is profitable to the farmers.

2. METHODOLOGY

Bishnupur district is purposively selected for the present study since this district is one of the highest contributors of French bean production. The growers are tempted towards French bean cultivation due to its suitability and profitability. No studies have been conducted on economics of production and marketing in Manipur in general and that for Bishnupur district in particular. Therefore, the main objective of the present investigation was to prove into economic analysis of production of French bean in Bishnupur district.

2.1 Sampling Design

For the selection of district, block, villages and respondent farmers, a multi stage purposive

random sampling technique was used for the study.

2.2 Selection of District

Bishnupur district was selected as the district is an important district in the valley region on production of French bean. The Fig. 1 shows the systematic representation of Bishnupur district of Manipur.

2.3 Selection of Block

Among the three blocks of the district *viz.* Bishnupur, Nambol, Moirang, Bishnupur block was selected purposively for the study.

2.4 Selection of Block

A list of all the villages of selected block was prepared with the help of Block Development Officers and four villages viz. Toubul, Kwasiphai, Khoijuman and NgaikhongKhullen were selected from Bishnupur block by using simple random sampling technique.

2.5 Selection of Respondent Farmers

By adopting simple random sampling under proportional allocation, to make the optimum sample size of 100 for the study , 35 farmers from Toubul, 30 farmers from Khoijuman, 18 farmers from NgaikhongKhullen and 17 farmers from Kwasiphai were selected for the study.

2.5.1 Data collection

The primary data relevant to the objective of the study have been collected through survey method using pre tested schedules. The secondary data were collected from different reports and publication of the state government offices, journals, books and reliable sources.

Fig. 1. Schematic representation of Bishnupur district of Manipur

2.6 Data Processing and Analysis

The collected data were coded and recorded into a database system by using Microsoft excel Software and analyzed with the SPSS software.The cost, return and profit were worked out using different cost concepts viz., Cost A_1, Cost A_2, Cost B_1, Cost B_2, Cost C_1, Cost C_2 and Cost C_3. For the purpose of analyzing the returns from French bean production, various types of farm income were worked out which includes gross income, net income, farm business income, family labour income, farm investment income, returns to management and net return over total variable cost. The benefit cost ratio was also worked out.

2.6.1 Cost concept

The different cost components used in the analysis were as follows.

Fixed cost

It includes:

- Depreciation on farm implements and farm buildings
- Land revenue and other taxes
- Interest on fixed capital

Variable cost

It includes:

- Value of human labour
- Imputed value of family labour
- Value of fertilizers
- Value of seed
- Value of plant protection chemicals
- Irrigation charges
- Interest on working capital

Total cost = total Fixed cost + total Variable cost

The cost concepts in working out cost and returns were followed the cost concepts [6]:

Cost A_1:

It includes:

- Value of human labour
- Value of fertilizers
- Value of seed
- Value of plant protection chemicals
- Irrigation charges
- Depreciation on farm implements and farm buildings
- Land revenue and other taxes
- Interest on working capital

Cost A_2 : Cost A_1 + rent paid for leased-in land

Cost B_1 : Cost A_1 + interest on value of owned fixed capital assets (excluding land)

Cost B_2 : Cost B_1 + rental value of owned land (net of land revenue) and rent paid for leased-in land.

Cost C_1 : Cost B_1 + imputed value of family labour

Cost C_2: Cost B_2 + imputed value of family labour

Cost C_3: Cost C_2 + 10 per cent of cost C_2 as management cost

2.6.2 Income measures

Gross farm income = average yield per ha (kg) × average price per kg (Rs.)

Returns over variable cost = gross income – cost A_1
Farm business income = gross income – cost A_2
Family labour income = gross income – cost B_2
Net income = gross income – cost C_2
Returns to management = gross income – cost C_3
Farm investment income = farm business income- imputed value of family labor
Benefit cost ratio = gross income/ cost C_2

3. RESULTS AND DISCUSSION

The study aimed to work out the cost and return of French bean production by the respondent farmers of Bishnupur district of Manipur. The costs per hectare incurred in cultivation of sample farms are presented in Table 1.

The average cost of cultivation worked out to Rs. 238894 per hectare. A perusal of the table reveals that out of total cost of cultivation, hired human labour charges were the major cost item. It accounted for about 41.14 per cent of the total cost of cultivation. The imputed value of family labour and rental value of owned land were the next important cost components contributing about 11.56 and 11.30 per cent of the total cost of cultivation.

Apart from hired human labour and imputed value of family labour, the other variable inputs were seed, fertilizers, plant protection chemicals, irrigation, hired machines, interest on working capital and miscellaneous expenses which constitute 3.62, 7.33, 5.13, 4.21, 8.23, 2.05 and 0.23 per cents respectively. The other fixed costs were depreciation cost, land revenue and interest on fixed capital which constitutes 3.47, 0.23 and 0.90 per cents respectively.

Table 1. Cost of cultivation of French bean per hectare basis

Particulars/	Rs./ ha
Seed	8657 (3.62)
Fertilizer	17523 (7.33)
Plant protection chemical	12273 (5.13)
Irrigation	10075 (4.21)
Hired machinery	19670 (8.23)
Hired labour	98281 (41.14)
Imputed value of family labour	27632(11.56)
Land Revenue and other taxes	570 (0.23)
Dep. on farm implements & farm building	8298 (3.47)
Rental value of owned land	27000 (11.30)
Miscellaneous expenses	1864 (0.78)
Interest on working capital	4899 (2.05)
Interest on fixed capital	2152 (0.90)
Total Variable Cost	200874 (84.08)
Total Fixed Cost	38020 (15.91)
Total Cost(TVC+TFC)	238894 (100)
Cost A_1	182110
Cost A_2	182110
Cost B_1	184262
Cost B_2	211262
Cost C_1	211894
Cost C_2	238894
Cost C_3	262783

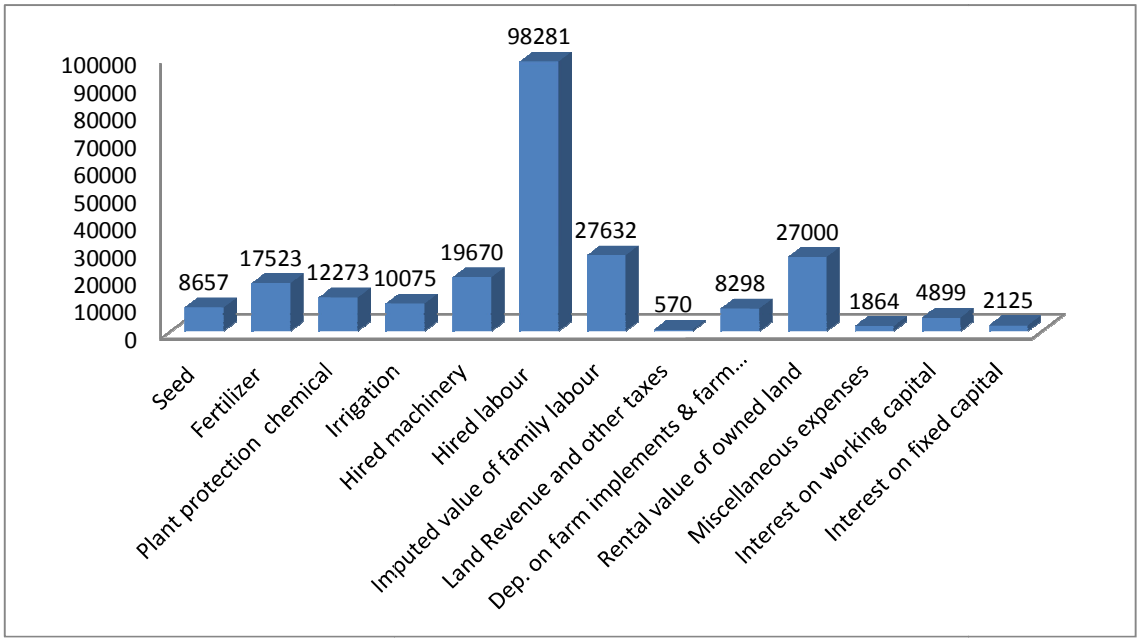

Fig. 2. Schematic representation of cost of French bean cultivation per hectare basis (Rs./ha)

The costs related to French bean production are split up into various components such as Cost A_1, Cost A_2, CostB_1, Cost B_2, CostC_1, CostC_2, and Cost C_3, which was used to derived different income measures. The farm management cost incurred in the cultivation of French bean in per hectare is presented in Table 1. Since there is no rent paid for leased in land, Cost A_1 and Cost A_2, are same which has been estimated at Rs. 182110. CostB_1, Cost B_2, CostC_1, CostC_2 and Cost C_3 have been estimated at Rs. 184262, Rs. 211262, Rs. 211894, Rs. 238894 and Rs. 262783 respectively per hectare.

Table 2. Returns of French bean per hectare basis

Particulars	Rs./ha
Gross Income	469856
Net Income	230962
Family Labour Income	258594
Farm Business Income	287746
Farm Investment Income	260114
Net Returns Over Variable Cost	287746
Returns to Management	207073
Returns per rupee	1.96

The returns of French bean were measured in relation to different cost concepts such as Gross Income, Net Income, Farm Business Income, Family Labour Income, Farm Investment Income, and Returns over Variable Cost and Returns to Management were analyzed. The Returns per Rupee were worked out based on $Cost_2$ and Gross Income.

The contents of the Table 2 reveal that French bean growing farms were noted to earn a gross income of about Rs. 469856 per hectare. The average yield per hectare was found to be 14454 kg and marketed surplus was 13176 kg. The average cost per kg is about Rs.35.66. The net income earned of about Rs. 230962. Family labour income was noted to be Rs. 258594.The farm business income was worked out to be Rs. 287746. The farm investment income was noted to be Rs. 260114. The net return over variable cost and returns to management were calculated as Rs. 287746 and Rs. 207073 respectively. The table also presents the returns per rupee of French bean per hectare. The returns per rupee are the important measures of efficiency and found to be 1.96 i.e. on an average Rs. 1 investment brings Rs. 1.96 returns in French bean. This finding is supported with the findings of Pawar [7] in black gram and Deshmukh [8] in tur crop.

4. CONCLUSION AND POLICY IMPLICATIONS

An efficient and economic production of vegetables plays a very important role in profitable crop farming. The present studyhas been conducted to analyze the Economic of French bean (*Phaseolus vulgaris* L.) production in Bishnupur District of Manipur.From the above findings, it may be concluded that cultivation of French bean cultivation is profitable as the B: C ratio is greater than 1 i.e., 1.96 and it indicates that French bean production is profitable to the farmers and this is supported with Raghupathi [9]. As the cost of human labour, rental value of owned land, hired machinery charges, fertilizers and other inputs were important contributors to the total cost. If inputs and production technology are made available to farmers in time and subsidized prices, yield and production may be increased which can help the farmers to increase the income and improve their livelihood conditions. The government and related departments should arrange training programs to upgrade the knowledge on recommended package of practices on cultivation of vegetable crops and educating the farmers to develop social consciousness by strengthening local security service through proper initiatives. The farmers also need to encourage forming farmers groups or farmer producer organization (FPOs) in order to improve the production and marketing efficiency.

ACKNOWLEDGEMENT

Above all, I would like to thank the co-authors for their kind support and valuable guidance, while conducting the research and revision of this paper. The authors also would like to thank the respondent farmers for sharing their valuable knowledge.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCE

1. Green bean production in 2016, Crops/Regions/World list/Production Quantity (pick lists). UN Food and Agriculture Organization, Corporate Statistical Database (FAOSTAT); 2017. Retrieved 27 September 2018.
2. Success report. Farmer portal; 2018-19. Available:https://farmer.gov.in.>SuccessReport.pdf&ved.

Accessed on 8th June,2019
3. U.S. Department of Agriculture, Agricultural Research Service. USDA Food and Nutrient Database for Dietary Studies; 2008 (release 3.0) [database]. Food Surveys Research Group website: Available:http://www.ars.usda.gov/ba/bhnrc/fsrg. \
4. Tripathi RS. Studied the Economic analysis of french bean (*Phaseolus vulgaris L.*) cultivation in rain-fed condition of Uttar Pradesh hills. *Legume research.*1993;15(1): 45-50.
5. Shelke. Economics of production and marketing of French bean in Satara district of Maharashtra, M.Sc. (Agri.) Thesis, submitted to Mahatma Phule Krishi Vidyapeeth, Ahmednagar, Maharashtra State, India; 2015.
6. CACP. Cost concept – cost of cultivation and production; 2018.
7. Available:https://cacp.dacnet.nic.in. Accessed on 4th June 2019.
8. Pawar ND. Economics of production and resources use productivity of black gram in Vidarbha region of Maharashtra state. J. Maharashtra Agril. Univ., 2006;31(1):100-103.
9. Deshmukh R, Jahagirdar SW, Warade SV, Ujjinkar VV. Economics of production of major crops in western Vidarbha region. J. of soils and crops. 2007;6(2):9-19
10. Raghupathi R, Mahadevaiah GS, Gaddi GM, Anjan Kumar M J. Cost Returns and Input use Pattern for French Bean Cultivation in Mysore District of Karnataka, India. Int. J. Curr. Microbiol. App. Sci, 2020;9(03):1586-1592. DOI:https://doi.org/10.20546/ijcmas.2020.903.186

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle4.com/review-history/71995