



Research Article

AN ECONOMIC ANALYSIS OF BRINJAL CULTIVATION IN BIRNI BLOCK OF GIRIDIH DISTRICT, JHARKHAND

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Received: September 15, 2018; Revised: September 25, 2018; Accepted: September 26, 2018; Published: September 30, 2018

Abstract: The study was conducted in Birni Block of Giridih District, Jharkhand during the year 2016-17. The purpose of the study is to find out profitability in terms of cost and return from brinjal cultivation in birni block of Giridih district, Jharkhand. The key objectives were to analyze the cost and return structure of brinjal cultivation and to identify the major constraints faced by the farmers in brinjal cultivation. Five villages were purposively selected on the basis of prior information and a primary survey was done. From each village 12 farmers were selected based on their land area under brinjal cultivation. For further detail studies and thus making a sample size of 60. It was revealed from the study that the overall average cost of cultivation of brinjal per acre in Birni was found to be Rs. 41688.37 out of which total variable cost was Rs. 30564.41. Highest percentage expenditure was on manures and fertilizers followed by labor costs. The per acre output was 100.51 quintal. The major problems in cultivation of brinjal were lack of water for irrigation, non-availability of credit, lack of scientific knowledge among farmers, high cost of seeds, pest and diseases, awareness on optimum use of fertilizers, high cost of labour etc

Keywords: Profitability, Cost of Cultivation, constraints of brinjal cultivation, per acre output

Citation: Upendra Kumar and Agarwal P.K. (2018) An Economic Analysis of Brinjal Cultivation in Birni Block of Giridih District, Jharkhand. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 18, pp.- 7147-7149.

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Introduction

India has secured second position in vegetable production after China. It has good and diverse climatic condition which is the source of all varieties of vegetable. Agriculture is the mainstay for the 80 percent of the rural population of the State. It is their employment and primary income generating activity. The agricultural economy of the Jharkhand is characterized by dependence on nature, low investment, low productivity, mono cropping with paddy as the dominant crop, in inadequate irrigation facilities and small and marginal holdings. Agricultural activities are depended totally on rainfall and 92 percent of the total cultivated area is yet to come under irrigation. The cultivable land resources of the State have good potential for higher production of horticulture and forest products. The soil is young and has a high capacity of fixation of humus. Vegetable Production 3.63 (million tonnes) in the Jharkhand. Major Vegetables Produced are Brinjal, Cabbage, Cauliflower, Ladies finger, Onion, Peas, Potato, Pumpkin, Mushroom, Capsicum, Green chilly etc. and Major Food Grains, Rice, Wheat, Maize Chickpea etc. Area under brinjal cultivation was 5581 hectares in Jharkhand and production of brinjal was 67864 ton in the year 2011-2012. Brinjal probably has its original home in India. In general, it is known with the name of Baingan, is crop gives a good return to farmers in every season, if it is cultivated and managed properly. In recent years, this crop is subjected to a wide fluctuation in its price throughout the country, but the demand for the same remained unaltered. This shows the necessity of brinjal in Indian households. Instead of such economic benefits of brinjal, there are also some constraints associated with its production. In 2016-17 India has total vegetable production 178172 (000MT) with 10238 (000 ha) area out of which brinjal contribution is 12510 (000MT) and 733 (000 ha) in production and area respectively. This is seven percent of the total vegetables areas and production. (Kumar and Agarwal 2017¹). Looking at the above facts, it is expected from this study that, through, find out the cost of cultivation, benefit cost ratio, returns over various cost concepts etc. would be helpful for efficient use of inputs and ultimately more economic returns against general crop production. The present study is therefore, undertaken in view of following specific objectives.

1. To work out the cost and return structure of brinjal cultivation
2. To identify the major constraints confronted by the farmers in brinjal cultivation.

Research Methodology:

The study was based on the input and output data obtained from the respondents of Birni block of Giridih district, Jharkhand. For a selection of respondent's multistage sampling design was employed. In this procedure, at first stage Giridih district was selected purposively. From Giridih district Birni block selected purposively due to suitable areas for brinjal crop and well known for researcher. Then on the third stage, lists of all the villages growing brinjal, falling under Birni block were prepared. Then from this list, five villages from block were selected randomly. From Birni block the villages selected were Paratappur, Orgo, Arwatanr, Kendua, Baliari. From each of selected village, lists of brinjal growers were prepared in ascending order according to the size of their holding under brinjal crop in their total cropped area. In the final stage, 12 farmers from each village was selected, who was having more area under brinjal cultivation. Thus, the total sample size was 60. The data so collected pertained to the Rabi season of the agricultural year 2016-17.

Analytical Procedure

Estimation of Costs and Returns

The farm management, cost concept approach is widely used in India for evaluating crop profitability in production. The cost concepts in brief, are Cost A1, A2, B1, B2, C1, C2, and cost C3.

COST A1: This gives the total cash expenses incurred by the owner or operator. It includes the following terms of costs.

- 1-Value of hired human labour.
- 2-Value of bullock labour.
- 3-Value of machinery charges

Table-1 Input used pattern for brinjal cultivation (Rs/acre)

Per acre input use pattern of brinjal Cultivation			
SN	Particulars	Birni	
		expenditure	percentage
VARIABLE COST			
1	Seed	975.41	2.33
2	Fertilizer and manures		
A	Urea	229.57	0.55
B	DAP	255.69	0.61
C	Super phosphate	188.67	0.45
D	Cow dung	8218.53	19.71
E	FYM	1398.08	3.35
	Sub total	11265.95	27.02
3	Plant protection chemicals	1583.99	3.79
4	Labour		
A	Family labour	9546.37	22.89
B	Hired labour	4773.18	11.44
	Sub total	14319.55	34.34
5	Bullock labour	2665.17	6.39
6	Interest on working capital	729.95	1.75
	Total variable cost	30564.61	73.49
FIXED COST			
1	Land revenue	106.61	0.25
2	Rental value of own land	6662.93	15.98
3	Depreciation	282.3	0.67
4	Interest on fixed capital	282.07	0.67
	Total fixed cost	7333.91	17.59
5	Managerial cost	3789.85	9.09
	Total cost of cultivation	41688.37	100

Source- Field Survey

Table-2 Return structure of brinjal cultivation

PARTICULARS	BIRNI
Income Measures (Rs/ acre)	
GROSS INCOME	110737.30
NET INCOME	69048.94
FARM BUSINESS INCOME	89330.16
FARM LABOUR INCOME	82385.16
FARM INVESTMENT INCOME	79783.8
Cost of Production	
OUTPUT (Qn)	100.51
COST OF PRODUCTION (Rs/q)	414.73
B:C Ratio	
B:C ratio on total Cost	2.65

Source Field Survey

Table-3 Problems faced by the Respondents in brinjal cultivation

SN	Problems	Garret Value	Percent Position	Mean Value	rank
1	Non Availability Of Seed on time	82	5	43.95	VIII
2	Non Availability of Fertilizer on time	70	15	41.80	X
3	Improper knowledge about fertilizer doses	63	25	46.55	VI
4	High cost of Seed	58	35	45.03	VII
5	High cost of pesticide	52	45	42.65	IX
6	Low productivity	47	55	51.12	IV
7	Non Availability of Credit on time	42	65	59.02	II
8	Lack of Scientific Knowledge	37	75	56.00	III
9	Irrigation problem	30	85	63.05	I
10	Insect and pest related problem	18	95	50.33	V

Source Field Survey

- 4- Value of fertilizers and manures.
- 5- Value of seeds.
- 6- Value of insecticides, pesticides and weedicide
- 7-Irrigation charges.
- 8-Depreciation on farm implements
- 9- Interest on working capital.

10-Land revenue paid to government.

COST A2 = Cost A1+ Rent paid for leased in land, if any

COST B1 = Cost A1 + Interest on value of owned fixed capital assets.

COST B2 = Cost B1 + Rental value of owned land less land revenue

COST C1 = Cost B1 + Imputed value of family labour.

COST C2 = Cost B2 + Imputed value of family labour.

COST C3 = Cost C2 + 10% of Cost C2 on account of managerial functions performed by the farmer.

In the present study, the rent paid for leased in land was zero, as none of the sample farmers took land on lease basis. Hence, cost A1 and cost A2 are similar.

Rates of Returns over Different Cost Concepts

Gross Income: Yield of main product (in qt./kg) x their prices (Rs.)

Net Income: Gross Income – Cost C.

Farm Business Income: Gross Income – Cost A2

Farm Investment Income: Farm business income- wages of family labour

Family Labour Income: Gross Income – Cost B

Cost of production: The cost of production was worked by the following formula:

$$\text{Cost of production/ qt} = \frac{\text{Cost of cultivation Rs/acre}}{\text{Quantity of main product qn/acre}}$$

To identify the major constraints confronted by the farmers in onion cultivation.

For achieving this objective, Garret's Ranking Technique was used [2].

Garret's Ranking Technique

$$\text{Percent Position} = 100(\text{Rij}-0.50)/\text{Nij}$$

Where Rij is the rank given given for ith item by the Jth individual.Nij is the number of items ranked by the Jth individual.

With the help of Garrett table, the percent position was converted in to score than individual score of each respondent were added together and calculate the mean score through total number and finally arranged the mean score in descending order and ranked them.

Results and Discussion

The productivity and income from the crop production can be judged in a better way, if we analyze it with respect to the different costs incurred during cultivation of a particular crop. The cost of cultivation and cost of production of any crop is the most important aspect of the farm economy, both at the micro and macro level point of views; it provides guideline to the government in promulgating the price policy both for factors of production and the produce. The Input costs were classified in two broad heads, namely variable cost and fixed cost. The variable cost includes cost of human labour (family and hired), machinery labour, seeds, manures, fertilizers, pesticides, herbicides, and interest on working capital. On the other hand, fixed cost involves land revenues, rental value of owned land and depreciation (Agarwal 2013). In order to estimate the cost of cultivation of brinjal the various inputs purchased from the market were valued at the actual price paid by the farmers and the home produced inputs like compost etc. were estimated at the prevailing market price. The family labour and owned machine used at the farm were assessed at the engaging wage rate for hiring casual labour and the prevailing custom hiring charges for such machines during the survey period. The profitability of brinjal cultivation in study area has been analyzed by computing per acre costs and returns. Table No. 1 depicts the pattern of input used for brinjal cultivation in Birni block of Girdih District of Jharkhand. The overall cost of cultivation of brinjal per acre in Birni was found to be Rs. 41688.37 out of which variable cost was Rs. 30564.41 per acre. The total fixed cost (Land revenue, Rental value of land, Depreciation) calculated under Birni was Rs. 7333.91. Human labour values have the highest percentage expenditure incurred on inputs followed by manures and fertilizers out of total variable cost. The return structures of brinjal cultivation have given in the [Table-1]. The gross income (Rs. /Acre) for the farmers of Birni was found to be Rs. 110737.30. Net income (gross income-total cost) of the farmers was Rs. 69048.94 in study area. The other three return structures, namely Farm Business Income, Farm Investment Income and farm

Labour Income were Rs. 89330.16, Rs. 82385.16 and Rs. 79783.80 respectively in study area. The production obtained from land of Birni was 100.51 quintal per acre. Cost of production, which is the ratio of the total cost and output, was Rs. 414.73 per quintal. Benefit Cost Ratio shows the income received against per rupees investment. In Birni block the B: C ratio estimated over total cost was 2.65. In the study area, the sampled farmers had no leased in land. So, rent paid for leased in land was zero. Therefore, Cost A1 and Cost A2 were same in brinjal cultivation. The per acre costs i.e. Cost A, Cost B and Cost C were given in fig.1. The farmers of birni were asked to list priority wise 10 major constraints they were facing in brinjal cultivation. All data were stored screened and ranks were allotted according to garret's method. It was clear from the table that the first rank was assigned to the Irrigation problem. The second most severe problem observed in birni was non availability of credit on time followed by lack of scientific knowledge on agriculture practice, Low productivity, improper knowledge about fertilizer doses, insect and pest related problem, high cost of seed, non availability of seed on time, non availability of fertilizer on time and high cost of pesticides on brinjal cultivation. The scarcity of water was the most severe problem observed for brinjal cultivation in study area. Due to this causes farmer not cultivate land around the year. In winter season the water requirement was less as compared to the summer season. As in summer season most of the famers were not able to irrigate their cultivable land and thus the land remains fallow which affects the economy of famers [Table-3].

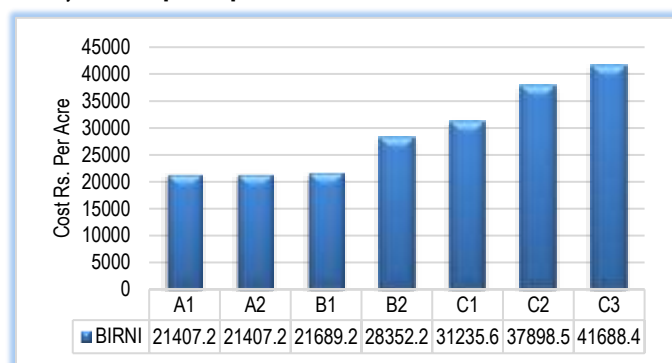


Fig-1 Per acre various cost concepts used in brinjal cultivation

Summary, Conclusion and Suggestions

The core message of this paper is to construct a economic structure of brinjal cultivation and identification of major constraints of brinjal cultivation. To investigate this, the present study has used cost concept and garrett ranking tool. Brinjal crop was growing largely during rabi season in the study area. The overall cost of cultivation of brinjal per acre in Birni was found to be Rs. 41688.37. Human labour values has the highest percentage expenditure incurred on inputs followed by manures and fertilizers out of total variable cost. The major constraint encountered by respondents in the study areas were Irrigation problem, non availability of credit on time followed by lack of scientific knowledge on agriculture practice, Low productivity, improper knowledge about fertilizer doses, insect and pest related problem, high cost of seed, non-availability of seed on time, non availability of fertilizer on time and high cost of pesticides on brinjal cultivation. A large portion of respondents didn't have soil health card and they even did not know how to get it. Government and extension agencies should ensure the proper distribution of soil health card and create awareness on how to use, how much to use and when to use the fertilizers. A major issue reported in study area was pest, and disease infestation in several crops. So, awareness should be created among farmers for disease, pest and weed infestation and their management. For this, cost effective and easy to prepare organic pesticides should be made popular in the villages via large scale demonstration in agricultural fairs and awareness campaign. Illiteracy was one of the major problems in the study area and it's a big barrier in the social development of people. Informal education should be ensured for such farmers by NGO and other agencies.

Application of Research: This research will be helpful in brinjal cultivation. The cost of cultivation and cost of production of any crop is the most important aspect

of the farm economy, both at the micro and macro level point of views; it provides guideline to the government in promulgating the price policy both for factors of production and the produce. We can know the cost and return structure of brinjal cultivation from this research and can allocate the crop area accordingly. We can analyze it with respect to the different costs incurred during cultivation of a particular crop.

Research Category: Crop Cultivation

Acknowledgement / Funding: Author thankful to Ramakrishna Mission Vivekananda University, Morabadi, Ranchi, Jharkhand 834008, India

***Research Guide or Chairperson of research: Dr P.K. Agarwal**

University: Ramakrishna Mission Vivekananda University, Morabadi, Ranchi, Jharkhand 834008, India

Research project name or number: An Economic Analysis of Brinjal Cultivation in Giridih District of Jharkhand

Author Contributions: All author equally contributed

Author statement: All authors read, reviewed, agree and approved the final manuscript

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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