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Brinjal: Economic study on the various cost and profit measures of Brinjal crop in Mau District of Uttar Pradesh

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Abstract

Brinjal is one of the popular vegetable crops grown in India, as well as, other parts of the world. It is grown throughout the year under tropical and subtropical conditions except higher altitudes. China followed India is the second largest producer of brinjal being cultivated over an area of 730.4 (000, ha), production 12800.8 (000, MT) with an average annual production of 17.5 million tons per ha in the year 2017-18. Mau district was purposively selected seeing the awareness and convenience of investigator being the native of this district. A list of blocks falling under Mau district of U.P. along with acreage under vegetable cultivation was prepared. A list of all villages falling under the selected block was prepared also. Five top ranking vegetables growing villages were selected for the study. A list of all vegetable growers of each selected village was prepared and stratified into three groups *viz.* marginal, small and medium farms. Multistage stratified random-cum-purposive sampling was applied for selecting the block, village and respondents. Ultimately, 100 respondents (75 marginal, 14 small and 11 medium) were selected, randomly. The study was pertained to the agriculture year 2019-20. The cost of cultivation was observed higher on marginal farms (Rs. 98091.00) followed by small farms (Rs. 93549.55) and medium farms (Rs. 91426.46), respectively. The overall average of the input-output ratio on the basis of various costs varies from 1:2.50 to 1:1.86 in the study area.

Keywords: Brinjal, Economic, profit measures, *Solanum melongina* L.

Introduction

Brinjal (*Solanum melongina* L.) belongs to the family Solanaceae and is one of the popular vegetable crops grown in India, as well as, other parts of the world. It is known as Brinjal in India and Aubergine in Europe. Brinjal is also known as eggplant because of its resemblance to the shape of egg. Overall, this favourite vegetable is counted in the top ten vegetables of the world. Around one quarter of the world production is occupied by India. In the world area, production and productivity of brinjal in year 2016 was 1.79 million ha, 51.29 million tons and 28.59 tons per ha, respectively (Source – www.faostat3.fao.org). It is widely grown in India, China, Egypt, Turkey, Iran, Indonesia, Iraq, Japan, Italy, Philippines and several African countries. Asia content is main producer of brinjal as China covers 53% of the brinjal production. India contributes 28% production and Turkey 4% (Daunay *et al.*, 2001). China is leading having first rank in production with 32.03 million tons, area with and 0.78 million ha and productivity with 40.96 tons per ha, respectively in the whole world during the year 2016-17. India is the second largest producer of brinjal being cultivated over an area of 730.4 (000, ha), production 12800.8 (000, MT) with an average annual production of 17.5 million tons per ha in the year 2017-18 (Source – www.faostat3.fao.org). In India, it is widely grown in West Bengal, Odisha, Gujarat, Madhya Pradesh, Chhattisgarh, Maharashtra, Andhra Pradesh, Haryana, Assam, Uttar Pradesh, Jharkhand and Tamil Nadu. Brinjal crop is cultivated in Uttar Pradesh over an area of 8.01(000, ha) with an annual production of 275.40 (000, million tons) and productivity of 34.40 (MT/ha) in the year 2017-18 (www.faostat3.fao.org) while the West Bengal ranks 1st having the area and production of 163.15 (000, ha) and 3027.00(000, million tons), respectively in the year 2017-18. However, U.P. is on apex in the productivity over India. It is the fourth most important vegetable after potato, onion and tomato in India. Three crops of brinjal are grown in India; first during the *kharif* season (June-September), second during the *rabi* season (November-February) and third in the month of March. In India, brinjal is primarily grown by marginal, small and medium farmers for home consumption as well as serve as source of income. But, the production of brinjal faces a number of problems which cause enormous yield losses. Among the insect-pests, the most devastating is the fruit and shoot borer (FSB), which not only causes a significant yield loss (60-70%), but deteriorates the product quality also, making the produce less remunerative.

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Brinjal being the most important to the growers and consumers, there is pressing need to increase its productivity to fulfil the increasing demands round the year. Therefore, it is necessary to evolve high yielding varieties or hybrids to its high yield potential, earliness, quality and resistance attitudes to meet the demand of increasing population. Brinjal is one of the important vegetable crops of Mau district of Uttar Pradesh. It is also an important vegetable crop for doubling the farmers' income of this district. In this district, sufficient area is devoted for its cultivation. Brinjal cultivation seems to generate opportunity of employment and boosting the income of farmers of Mau district of U.P. By going through the literatures available.

Research Methodology

This chapter deals with sampling techniques, data collection, tabulation and functional analysis of data. Multistage stratified random-cum-purposive sampling was applied for selecting the block, village and respondents. Mau district was purposively selected seeing the awareness and convenience of investigator being the native of this district. First of all, a list of blocks falling under Mau district of U.P. along with acreage under vegetable cultivation was prepared and arranged in descending order. One block namely, Fatehpur Mandav block having highest acreage in Brinjal cultivation was selected purposively for this study. A list of all villages falling under the selected block was prepared and arranged in descending order according to the area under vegetable crops. Five top ranking vegetable growing villages were selected for study. The selected villages are Katghara Shankar, Kakaradih, Hasanpur Nemdar, Dharawal Prawnand, Gothari. A list of all vegetable growers of each selected village was prepared along with their size of holding and then, it was arranged in ascending order to their operational size of holding. The

farmers were stratified into three groups *viz.* Marginal: below 1 ha, Small: 1-2 ha and Medium: 2-4 ha. Twenty respondents from each selected village were selected randomly according to their proportion in population *viz.*, Marginal, Small and Medium farms. Ultimately, 100 (75 marginal, 14 small and 11 medium) respondents were selected for conducting detail study of present investigation. The primary data were collected by survey method through personal interview with the use of pre structured schedules. Secondary data were collected from Zila Vikas Bhawan, Department of Agriculture, Block Head Quarter, journals, reports, books and internet etc. Both tabular and functional analyses of data were used for tabular analysis. Percentage, simple and weighted averages were used and Cobb-Douglas production function was used for functional analysis.

Results and Discussion

Per ha costs and returns from the cultivation of brinjal crop on different categories of farms were worked out and presented in Table - 1. It is depicted from the Table that on an overall average, costs of cultivation (C_3) came to Rs. 114450.51 per ha which was maximum of marginal farms followed by small and medium farm Rs.117913.14, Rs. 114470.88 and 111088.56 per ha, respectively. As far as the income measure are concerned it is observed from the Table that the gross income per ha was maximum to Rs. 221821.60 on medium farm followed by small and marginal farm (Rs. 215379.00 and Rs. 203167.00), respectively. Whereas the average gross income on overall farms came to Rs. 213455.86, other incomes measures like a net income, farm business income and family labour income were also worked out and presented in the table showing same trend as gross income. If the size of farm increases the various measures of income also increases was observed in the study area.

Table 1: Per hectare costs and returns of brinjal on the basis various costs in the study area (Rs./ha)

Sl. No.	Items	Size group of farms			Overall
		Marginal	Small	Medium	
1.	Cost A ₁	87722.74	84858.74	83380.88	85306.91
2.	Cost A ₂	92852.89	90668.16	88162.48	90543.64
3.	Cost B ₁	99532.88	96833.07	94507.47	96940.95
4.	Cost B ₂	104663.03	102642.49	99289.07	102177.68
5.	Cost C ₁	95383.63	98255.02	96208.00	98809.19
6.	Cost C ₂	107193.77	104064.44	100989.60	104045.92
7.	Cost C ₃	117913.14	114470.88	111088.56	114450.51
8.	Gross income	203167.00	215379.00	221821.60	213455.86
9.	Cost of Production				
a.	Yield (Qt./ha)	213.86	239.31	252.07	235.08
b.	Cost of production (Rs./Q.)	551.35	478.33	440.71	490.13
10.	Farm business income	110314.11	124710.84	138440.72	124488.55
11.	Family labour income	98503.97	112736.51	122532.53	111257.67
12.	Net income	85253.86	100908.12	110733.00	98964.99
13.	Benefit-cost ratio				
I.	A ₁ basis	1:2.31	1:2.53	1:2.66	1:2.50
II.	A ₂ basis	1:2.19	1:2.37	1:2.52	1:2.36
III.	B ₁ basis	1:2.04	1:2.22	1:2.35	1:2.20
IV.	B ₂ basis	1:1.94	1:2.09	1:2.23	1:2.09
V.	C ₁ basis	1:1.94	1:2.19	1:2.30	1:2.16
VI.	C ₂ basis	1:1.89	1:2.06	1:2.19	1:2.05
VII.	C ₃ basis	1:1.72	1:1.88	1:1.99	1:1.86

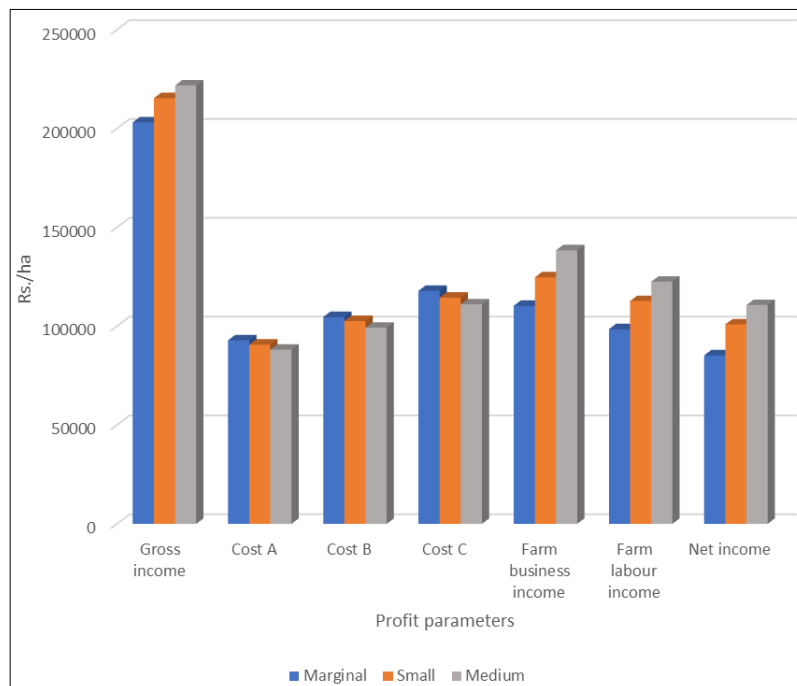


Fig 1: Profitability of brinjal crop

Summary and Conclusions

Vegetables act as the protective food and occupy unique place in human diet. Brinjal is one of them for their numerous commercial and medicinal uses. From the point of view of farmers' economy, it would be very useful to grow brinjal to earn good amount of net profit. Keeping the above objectives in mind, the study was conducted in five villages of Mau district. Total one hundred (100) respondents were selected for present investigation in *rabi* season. A pre-tested schedule was used for the collection of data. Multi-stage stratified random sampling procedure was applied for selection of district, block, village and respondents. Seeing time and money as well as constraints of investigator, Mau district was selected purposively. A list of all blocks falling under selected district was prepared and arranged in descending order according to acres under vegetable crops. One top ranking block was selected purposively. A separate list of all villages falling under selected block was prepared and five villages were selected, randomly. Again, a list of all farmers falling under each selected village was prepared. Farmers were stratified into marginal, small, and medium group of farms. Ultimately, one hundred respondents were selected randomly following their proportion in the population. The average size of land holding was 0.25 ha, 1.51 ha and 3.10 ha for marginal, small and medium farms, respectively. Per ha gross income was observed maximum under medium farms (Rs. 221821.60) followed by small farms Rs. 215379.00 and marginal farms Rs. 203167.00, respectively. The gross income per ha was highest on medium farm due to intensive cultivation and no. of irrigations on these farms was associated with better management of farmers and timely cultural operations through family labour. On an average, gross income came to Rs. 213455.86 whereas, net income was Rs. 98964.99 per ha. An overall average, farm business income and family labour income were worked out to be Rs. 124488.55, Rs. 111257.67 per hectare, respectively. The cost of production per quintal of brinjal was computed to be Rs. 551.35, Rs.478.33 and Rs.440.71 on marginal, small and medium farms, respectively. The input-output ratio related to cost C_3 was highest on medium farms (1:1.99) followed by small farms

(1:1.88) and marginal farms (1:1.72). Now we are at conclusion which reveals that the production of brinjal has been more profitable to different size group of farms in Mau district of Uttar Pradesh. We would be also realized it's having reasonable contributes to making the doubling the income of farmers and meet the requirements of per day per capita of the vegetables.

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