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An economic analysis of costs and return of finger millet in Bastar district of Chhattisgarh

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Abstract

The present study was focused to investigate the "economic analysis of production of finger millet in Bastar district of Chhattisgarh state of India." Chhattisgarh state consists of 28 districts out of which Bastar district had been selected purposively. out of 7 blocks (Jagdarpur, Bastar, Bakawand, Lohandiguda, Tokapal, Bastanar & Darbha) from Bastar district only one third of the total blocks i.e., Lohandiguda & Bastanar blocks were selected purposively on the basis of maximum area under selected minor millets for the purpose of the study subsequently, four villages namely Mardum, Matnaar, Kilepal and Turangur were selected for the study. Thus the total sample size was 97 for finger millet growers. Primary data was collected through personal interview method with the help of pre-tested questionnaire. The major findings of the study revealed that compound growth rate in finger millet for area, production and productivity shows significant growth. It was calculated that commercial cost of cultivation (C3) was Rs. 36900.35 per hectare. Cost A1/A2, Cost A2+FL, Cost B1, Cost B2, Cost C1 and Cost C2 were worked out Rs.18040.52, Rs.22353.02, Rs.18531.5, Rs. 28916.75, Rs.22844 and Rs. 33229.25 per hectare. The Benefit- Cost ratio in the cultivation of finger millet was estimated for cost A1/A2, Cost A2+FL, cost B1, cost B2, cost C1, cost C2 and cost C3 were 2.15, 1.73, 2.09, 1.34, 1.70, 1.17 and 1.05 respectively.

Keywords: Fixed cost, variable cost, cost-benefit ratio, cost of cultivation

Introduction

Millets are coarse grains and a repository of protein, fibre, vitamins and minerals. Millet belongs to Poaceae family and comprises of crops like pearl millet, sorghum, finger millets, foxtail millet, Kodo millet, Proso millet, barnyard millet and little millets. Millets are known to be rich in nutrients like - vitamins, minerals and essential fatty acids also have benefits in terms of prevention of degenerative disease besides their known functions of preventing nutritional deficiency diseases. Being non-glutinous, millets are safe for people suffering from gluten allergy and celiac disease. Therefore, millets are now being popularized by

"Miracle Grains/ Adbhut Anaj and nutri-cereals"

Finger millet (*Eleusine coracana* L. Gaertn.) (ragi) accounts for about 85% of production in India (Divya, 2011). Finger millet is grown in India, Srilanka, Nepal, parts of Africa, Madagascar, Malaysia, Uganda and Japan (<http://agritech.tnau.ac.in>). In India, finger millet is cultivated over an area of 1.19 million hectares with a production of 1.98 million tonne giving an average productivity of 1661 kg per ha. Karnataka accounts for 56.21 and 59.52% of area and production of finger millet followed by Tamil Nadu (9.94% and 18.27%), Uttarakhand (9.40% and 7.76%) and Maharashtra (10.56% and 7.16%), respectively (<http://www.indiastat.com>).

Finger millet is the prime staple food consumed by majority of population in South Karnataka. Finger millet has manifold nutritional benefits, it has thirty times more calcium than rice (Millet Network of India-Deccan Development Society-FIAN, 2009). Finger millet straw is an extensive feed in the livestock sector. Finger millet is not a season bound crop and hence if moisture is available, can be cultivated throughout the year (<http://www.agritech.tnau.ac.in>).

Objectives

1. To examine growth rate of Area, Production and Productivity of Finger Millets in Bastar District of Chhattisgarh.
2. To work out the cost and returns of Finger millets.

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Methodology

Chhattisgarh state consists of 28 districts out of which Bastar district have been selected purposively. Out of the total 7 blocks (Jagdapur, Bastar, Bakawand, Lohandiguda, Tokapal, Bastanar & Darbha) of Bastar district. Only one third of the total blocks i.e., Lohandiguda & Bastanar blocks were selected purposively on the basis of maximum area under selected minor millets for the purpose of the study

Four villages namely Mardum, Matnaar, Kilepal and Turangur were selected purposively for the study looking to the responses of villagers and minor-millets grower. Out of 610 farm families in selected villages a sample of 15 percent respondents i.e. 97 farmers was selected by using probability proportional to size techniques

Compound Growth Rate

Annual compound growth rates in area, production and productivity of minor millets were worked out for Bastar district of Chhattisgarh state by fitting an exponential function of following form:

$$Y = A B^t$$

$$\log y = \log A + t \log B$$

Y = area/production/productivity
A = Constant
B = regression coefficient
T = time in year

Cost Concept

Cost A₁=All actual expenses in cash and kind incurred in production

Wages of hired human labour

Imputed value of owned bullock labour

Value of hired bullock labour

Charges of hired machinery

Imputed value of owned machinery

Imputed value of owned seed

Imputed value of manures

Land revenue, cess and other taxes

Value of manure (owned or purchased)

Cost A₂= Cost A₁+ Rent paid for leased-in-land

Cost B₁= A₁+ Interest on value of owned capital (excluding land)

Cost B₂= B₁+ Rental Value of owned land and rent paid for leased land

Cost C₁= B₁+imputed value of family labour

Cost C₂= B₂+ imputed value of family labour

Cost C₃= C₂+ managerial cost of 10% of cost C₂

Income measures

- Net income = Gross income – total input cost
- Family labour income = Net income + total family labour
- Farm business income = Total family labour + interest on working capital

Benefit cost ratio (BCR)

It is the ratio between the discounted cash inflows and discounted cash outflows and the ratio must be unity or more for an investment to be considered worthwhile. The benefit cost ratio (BCR) was worked out by using following formula:

$$B:C \text{ ratio} = \frac{\sum_{i=1}^n \frac{B_n}{(1+r)^n}}{\sum_{i=1}^n \frac{C_n}{(1+r)^n}}$$

Where,

B= benefit in nth year

C = Cost in nth year

n= number of years

r= discount rate

Result and discussion

The growth of area, production and productivity of finger millet was analyzing in Bastar District of Chhattisgarh, India and this study revealed that the growth rate of area and productivity were significant.

On an average the total cost of cultivation per hectare of finger millet was obtained Rs. 33336.02. The breakup of total cost into operational and fixed costs indicated that operational cost were Rs.18095.52 and fixed cost were Rs. 15240.50. The expenditure incurred towards human labour was Rs. 8250. And bullock labour Rs.3700. The machinery cost was obtained Rs. 4162.5. In the study area there was no use of single dose of pesticides but for fulfillment of some plant nutrient essential fertilizers was used in some proportion. Farmers had spent Rs. 1498.75 on fertilizers. Among the fixed costs, expenditure incurred maximum on rental value of owned land which was Rs.10385.25 per hectare.

Table 1: Cost of cultivation per hectare of finger millet

S. No.	Particulars	Value (Rs.)
1	Family human labour	4312.5
2	Hired human labour	3937.5
3	Total human labour	8250
4	Bullock labour	3700
5	Machine charge	4162.5
6	Fertilizer cost	1498.75
7	Seed cost	302.75
8	Interest on working capital	181.52
	Total operational cost	18095.52
9	Rental value of owned land	10385.25
10	Land revenue	20
11	Depreciation on implements	1300
12	Interest on fixed capital	490.98
	Total fixed cost	15240.50
	Gross cost (TVC+TFC)	33336.02

Cost concepts

The cost of cultivation of finger millet as per the cost concept worked out and presented in table 2. It is clear from the table 2 that there was no leasing activity among the sample farmers hence cost A and Cost A₂ remained the same. It was calculated that cost of cultivation (C₃) was Rs. 36900.35 per hectare. Cost A₁/A₂, Cost A₂+FL, Cost B₁, Cost B₂, Cost C₁ and Cost C₂ were worked out Rs.18040.52, Rs.22353.02, Rs.18531.5, Rs. 28916.75, Rs.22844 and Rs. 33229.25 per hectare.

Table 2: various cost of finger millet cultivation

S. No.	Particular	Cost (Rs./ha.)
1	Cost A ₁	18040.52
2	Cost A ₂	18040.52
3	Cost A ₂ +family labour	22353.02
4	Cost B ₁	18531.5
5	Cost B ₂	28916.75
6	Cost C ₁	22844
7	Cost C ₂	33229.25
8	Cost C ₃	36900.35

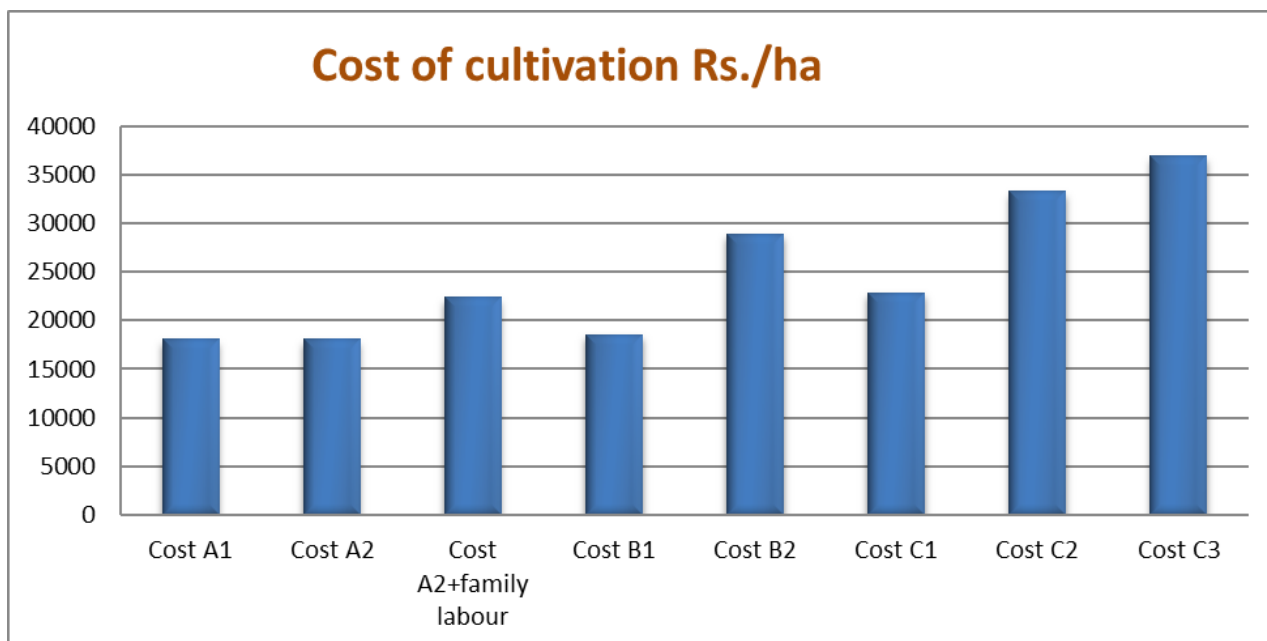


Fig 1: Cost of cultivation of finger millet based on cost concept

Output and returns

The details of output and returns per hectare from production of finger millet are presented in table 3. On an average total yield of main product of finger millet was 14.4 quintals. Total cost of production obtained Rs. 2508.35 per hectare. From the sampled households, on an average the total come was realized Rs. 38880 per hectare and the net return was estimated Rs. 9863.98 per hectare.

Table 3: Output and returns per hectare of finger millet

S. No.	Particulars	Units	Output and returns
1	Gross Cost	Rs.	33336.02
2	Yield	Quintals	14.4
3	Price of main product	Rs.	3500
4	Value of production	Rs.	38880
5	Cost of Production	Rs.	2508.35
6	Net return	Rs.	9863.98

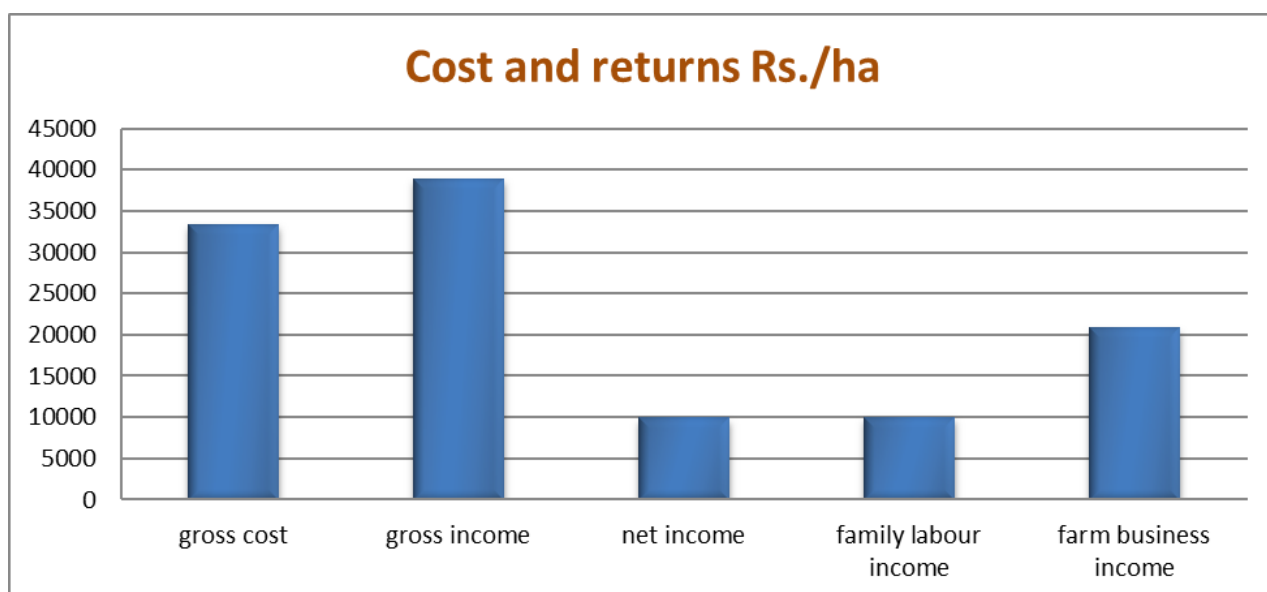


Fig 2: Cost and returns of finger millet

Measures of farm Income

To accomplished this objective, various farm efficiency measures viz. farm business income (FBI), family labour income (FLI) and net income (NI) of expenditure were worked out and presented in table 4. The gross income estimated in the cultivation of finger millet was Rs. 38880 per hectare. Though the gross income is a measure to analyze the efficiency of farm business, but it alone does not help us to judge the success of farm business. Therefore, another measure namely net income which represents surplus over the total costs was estimated. Higher net income reflects the

degree of success of farm business. Finger millet farmers in the study area realized a net income of Rs.9863.98 per hectare. Farm business income is a measure which indicates return for owned resources like land, labour and capital and this amounted to Rs.20839.48 per hectare. Family labour income is another measure of farm efficiency which represents the returns to farmer’s owned labour and family labour and this amounted to Rs.9963.25 per hectare. The overall input-output ratio was obtained 1:1.16.

Table 4: Measures of farm income of finger millet production

S. No.	Particulars	Farm income (Rs./ha.)
1	Gross income (Rs)	38880
2	Net income (Rs)	9863.98
3	Family labour income	9963.25
4	Farm business income	20839.48
5	Input-Output ratio	1:1.16

Returns and benefit cost ratio

Benefit-Cost ratio is an important tool to judge the profitability of an enterprise. It helps to locate the breakeven output, which is the minimum output that needs to be produced to continue the production without incurring loss. The output-input ratio in the cultivation of finger millet was worked out and presented in table 5. The Benefit- Cost ratio in the cultivation of finger millet was estimated for cost A1/A2, Cost A2+FL, cost B1, cost B2, cost C1, cost C2 and cost C3 were 2.15, 1.73, 2.09, 1.34, 1.70, 1.17 and 1.05 respectively.

Table 5: returns over different costs and benefit-cost ratio

S. No.	Particulars	Returns over cost (Rs.)	B:C ratio
1	Income over cost A1/A2	20839.48	1:2.15
2	Income over A2+FL	16526.98	1:1.73
3	Income over Cost B1	20348.5	1:2.09
4	Income over Cost B2	9963.25	1:1.34
5	Income over Cost C1	16036	1:1.70
6	Income over Cost C2	5650.75	1:1.17
7	Income over cost C3	1979.15	1:1.05

Conclusion

On an average the total cost of cultivation per hectare of finger millet was obtained Rs. 33336.02. The breakup of total cost into operational and fixed costs indicated that operational cost were Rs.18095.52 and fixed cost were Rs. 15240.50. It was calculated that commercial cost of cultivation (C3) was Rs. 36900.35 per hectare. Cost A1/A2, Cost A2+FL, Cost B1, Cost B2, Cost C1 and Cost C2 were worked out Rs.18040.52, Rs.22353.02, Rs.18531.5, Rs. 28916.75, Rs.22844 and Rs. 33229.25 per hectare. On an average total yield of main product of finger millet was 14.4 quintals. Total cost of production obtained Rs. 2508.35 per hectare. From the sampled households, on an average the total income was realized Rs. 38880 per hectare and the net return was estimated Rs. 9863.98 per hectare.

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