

Original Research Article

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## Cost of Cultivation of Tomato Crop in Durg District of Chhattisgarh, India

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### ABSTRACT

Tomato is rich source of vitamins A, C, Potassium, Minerals and Fibers. Tomatoes are used in the preparation of soup, salad, pickles, ketchup, puree and sauces and also consumed as a vegetable in many other ways. In Chhattisgarh, total production of tomato is 868.60 ('000) MT from an area of about 52.89 ('000) Ha. (Joint director horticulture, 2017-18). The major tomato producing districts are Raipur, Durg, Bastar, Jashpur and Bilaspur. Fourty farmers were selected purposively from four villages i.e. Banbarad, Aheri and Baghdumar. Five wholesalers and seven retailers were also selected for the fulfilment of the objectives. The primary data were collected for year 2018-19. On an average cost of cultivation per hectare of tomato was found to be Rs 168023.6. The average cost of production per quintal of tomato was worked out to be Rs.360.4864. The input-output ratio of tomato was found to be 1:1.71 at sample farms.

#### Keywords

Total production,  
Cost of cultivation,  
Input-output ratio

#### Article Info

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### Introduction

Tomato (*Lycopersicon esculentum*) belongs to the genus *Lycopersicon* under Solanaceae family. Tomato is rich source of vitamins A, C, potassium, minerals and fibers. Tomato is one of the most important protective food crops of India. India ranks second in the area as well as production of tomato next to China. Tomato production is expected to be 19.33 million tonnes, up 1.68 per cent, compared to 19.01 million tonnes in 2018-19. Total horticulture production in the country stood at

310.74 million tonnes in 2018-19, as per final estimates released by the ministry of agriculture and farmers welfare. This is marginally higher than the horticulture production in 2017-18.

In Chhattisgarh, total production of tomato is 868.60 ('000) MT from an area of about 52.89 ('000) Ha. Chhattisgarh accounts for about 4.98% of the total production of Tomato in the country. The productivity of tomato crop in Chhattisgarh is 16.42 MT/Ha. which is found lower to all India average of

21.99 MT/Ha. The major tomato producing districts are Raipur, Durg, Bastar, Balod and Jaspur. In Chhattisgarh, total production of tomato is 11,33,435 MT from an area of about 64,681 Ha (2017-18). The major tomato producing districts are Raipur, Durg, Bastar, Balod and Jaspur.

### **Materials and Methods**

The study was confined to Durg district of Chhattisgarh state because tomato was grown in both Kharif & Rabi seasons. Out of three blocks of the district, Dhamdhablock was selected purposively. The list of tomato growers was obtained from the District director horticulture, Durg. From the list of 231 tomato growers 18 per cent tomato growers were considered and proportionate to their percentages as per the farm size of holdings. Therefore 40 tomato growers were looking to the responses for the study. This comprised of 4 tomato growers for marginal farms, 14 for small farms, 17 for medium farms and 5 for large farms, respectively.

The simple averages and percentage statistical tools were applied to analyze the data and report the results/ outcomes of the study.

Input output ratio = Gross income / Total cost.  
Benefit-cost = Net income / Total cost.

### **Results and Discussion**

The cost of cultivation of tomato of sampled farms is worked out in Rs/ha and presented in Table 1. It clearly shows that the cost of cultivating tomato per hectare in large farms was higher than in marginal farms. Overall the cultivation cost per hectare of tomato has been found to be Rs per 168023.6 hectare on average. The cultivation costs were higher for large farms (Rs.188694.5 / ha) compared to marginal farms (Rs. 119031.1 / ha), small (Rs. 150994.9 / ha.) and medium farms (Rs.

169410.5/ha.). Cost of cultivation per hectare showed an upward trend with the rise in farm size. It was because the large farmers incurred more expenditure on modern farm inputs such as quality seed, fertilizer, plant protection material, hired labour, etc. as a result of borrowing from credit institutions and strengthened economic status compared to marginal, small and medium-sized farmers.

### **Yield, value of output and cost of production per quintal**

The yield, value of output per hectare and cost of production per quintal of tomato on the sampled farms have been worked out in Table 2. This indicates that the average yield per hectare of tomato was 466.1025 quintals of the sampled farms. Average cost of production of tomato was worked out in Rs/q and found to be Rs.360.4864 irrespective to the farm size. While it was the maximum under marginal farms (Rs.378.5736) followed by small farms (Rs.353.9828), medium farms (Rs.341.0789) and large farms (Rs. 321.5982).

It is interesting to note that marginal and small farms earned more on per rupee investment. It was due to better management of farm and crop by marginal and small farms than that of large farms. The average value of output per hectare came to Rs.372882. The higher value of output on large farms was associated with the higher expenditure incurred on modern farm inputs.

### **Profitability in tomato cultivation**

The net income, input-output ratio and benefit:cost ratio was worked out in Rs/ha by farm size of holding and presented in Table 3. It revealed that irrespective to the farms size, the net income earned by farmers was Rs/ha204858.4. The input-output ratio was found to be 1:1.71 and benefit of Rs 2.21 in

per rupee investment on tomato cultivation. The net income earned by farmers was found to be increasing with farm size of holding and ranging from Rs.132504.9to Rs. 280697.5 of

marginal to large farm size of holdings. The similar pattern of input- output and B: C ratio had also been noticed with respect to farm size of holding.

**Table.1** Economics of tomato on sampled farm

(Rs/ha.)

S.No	Particular	Farm size				
		Marginal	Small	Medium	Large	Overall
1	Family labour	34064 (28.62)	24604 (16.29)	12200 (7.2)	6400 (3.39)	14421.45 (8.58)
2	Hired human labour	24000 (20.16)	36000 (23.84)	48000 (28.33)	56000 (29.68)	46311.61 (27.56)
3.	Machine charges	5500 (4.62)	5500 (3.64)	5500 (3.24)	5500 (2.91)	5500 (3.27)
3	Seed cost	6000 (5.04)	7200 (4.77)	8400 (4.95)	9600 (5.09)	8321.813 (4.95)
4	Manures	1800 (1.52)	2400 (1.59)	2800 (1.65)	3200 (1.69)	2768.272 (1.65)
5	fertilizer	8400 (7.05)	9600 (6.36)	10200 (6.02)	10000 (5.29)	9962.606 (5.93)
6	Plant protection chemical and herbicide	16580 (13.92)	24650 (16.32)	32780 (19.34)	38000 (20.14)	31592.49 (18.80)
7	Staking	0	0	18000 (10.62)	22000 (11.66)	17691.22 (10.53)
8	Irrigation charges	1750 (1.47)	2200 (1.45)	2400 (1.41)	2600 (1.38)	2379.887 (1.42)
9	Interest on working capital	1280.6 (1.07)	2051 (1.35)	3073.92 (1.81)	2938 (1.56)	2751.798 (1.63)
10	<b>Total input cost (A)</b>	<b>99374 (83.48)</b>	<b>129205 (85.57)</b>	<b>143353.9 (84.62)</b>	<b>156238 (82.79)</b>	<b>141701.2 (84.33)</b>
11	Rental value of land	18000 (15.12)	20000 (13.25)	24000 (14.16)	30000 (15.89)	24292.96 (14.46)
12	Land revenue	12 (0.01)	12 (0.0079)	12 (0.007)	12 (0.0063)	12 (0.0071)
13	Depreciation on implements	416 (0.35)	416 (0.27)	416 (0.24)	416 (0.22)	416 (0.247)
14	Fixed Cost	18428 (15.481)	20428 (13.52)	24428 (14.42)	30428 (16.12)	24249.29 (14.43)
15	Interest on fixed capital	1228.53 (1.032)	1361.867 (0.90)	1628.533 (0.96)	2028.533 (1.07)	1645.153 (0.97)
	<b>Total fixed cost (B)</b>	<b>19656.53 (16.52)</b>	<b>21789.87 (14.43)</b>	<b>26056.53 (15.38)</b>	<b>32456.53 (17.20)</b>	<b>26322.44 (15.66)</b>
	C. Gross cost=(A+B)	119031.1 (100)	150994.9 (100)	169410.5 (100)	188694.5 (100)	168023.6 (100)

Note: Figures in the parenthesis are percentage to Gross cost of tomato.

**Table.2** Per ha. yield value of output and cost of production per quintal tomato(In ha)

S.No	Particular	Farm size				
		Marginal	Small	Medium	Large	Overall
1	Gross Cost(Rs/ha.)	119031.1	150994.9	169410.5	188694.5	168023.6
2	Yield (qt/ha.)	314.42	426.56	496.69	586.74	466.1025
3	Price (Rs/qt)	800	800	800	800	800
4	Value of Production (Rs/ha.)	251536	341248	397352	469392	372882
5	Cost of production (Rs/qt)	378.5736	353.9828	341.0789	321.5982	360.4864

**Table.3** Per hectare yield, value of output and cost of production per quintal of Tomato

(Rs/ha)

	Particular	Farm size				
		Marginal	Small	Medium	Large	Overall
1	Gross Cost (Rs/ha.)	119031.1	150994.9	169410.5	188694.5	168023.6
2	Output value (Rs/qt)	251536	341248	397352	469392	372882
3	Net income (Rs)	132504.9	190253.1	227941.5	280697.5	204858.4
4	Family labour income (Rs)	184256.35	132619.33	103880.75	69012.022	120749.8
5	Farm business income (Rs)	185484.9	133981.2	105509.3	71040.52	122394.9
6	Input –output ratio	1:2.5	1:1.87	1:62	1:1.36	1:1.71
7	B:C	1:2.11	1:2.25	1:2.34	1:2.48	1:2.21

**Table.4** Break-up of total cost, cost concept wise income over different cost in tomato crop

(Rs/ha)

S.No	Particular	Farm size				
		Marginal	Small	Medium	Large	Overall
<b>A</b>	Break-up of cost					
	a Cost A	99374	129205	143353.9	156238	141701.2
	b Cost A1	117374	149205	167353.9	186238	165994.16
	c Cost B	118602.5	150566.9	168982.4	188266.5	167639.3
	d Cost C	152666.5	175170.9	181182.4	194666.5	182060.8
<b>B</b>	Income over different cost					
	a Income over cost A	203484	153981.2	129509.3	101040.5	146687.9
	b Income over cost A1	185484.9	133981.2	105509.3	71040.52	122394.9
	c Income over cost B	184256.4	132619.3	103880.8	69012.02	120749.8
	d Income over cost C	150192.4	108015.3	91680.75	62612.02	106328.3

### **Cost and returns on the basis of cost concept**

The cost and returns based on cost concept in the production tomato on the sample farm of different size groups have been presented in table 4 that on an average Cost A, Cost A1, Cost B and Cost C were worked out to be Rs.141701.2, Rs.165994.16, Rs167639.3, and Rs. 182060.8per hectare respectively on the sample farms. The income over different cost were also worked out .The average income over Cost A, Cost A1, Cost B and Cost C were calculated as Rs 146687.9 , Rs 122394.9 , Rs 120749.8, and Rs106328.3respectively.

Conclusions of the study are as follows:

On an average the cost of cultivation per hectare of tomato was calculated Rs. 1190311.1, Rs.150994.9, Rs. 169410.5 and Rs. 188694.5 respectively marginal, small, medium and large farms.

On an average the input-output ratio of tomato came to 1:1.71 respectively on the sample farms.

On an average the B:C ratio of tomato came to 1:2.21 respectively on the sample farms.

The incomes over different costs were also worked out. The average income over cost-A, cost-B and cost-C were calculated as Rs.146687.9, Rs.120749.8and Rs.106328.3 per hectare, respectively.

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