



## AN ECONOMIC ANALYSIS OF CULTIVATION AND MARKETING OF TOMATO IN CHHATTISGARH

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### Abstract

Tomato is rich source of vitamins A, C, Potassium, Minerals and Fiber. Tomatoes are used in 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 11,33,435 MT from an area of about 64,681 ha (2018-2019), 64383ha area and the production tomato 1114802 MT (2019-20), the production of tomato 1182648MT from an area of about 64717ha (2020-21) respectively. The major Tomato producing districts are Raipur, Durg, Bastar, Balod, Bilaspur and Jhapa. Farmer data is collected as to made farmer profile according to various category i.e., age, educational level, farming experience, occupational status, land holding, average yield, annual income. So according to it small scale, marginal scale, medium scale 200 respondents were selected purposively from various district namely, Durg, Raipur, Bemetara and Bilaspur, area. The primary data were collected for the year 2021-22 on an average cost of cultivation per acre of Tomato was found to be Rs 6,84,348.2. The B:C Ratio of Tomato was found to be 1.6 at sample farms.

**Index Terms:** Economic analysis, cultivation, marketing, tomato, Chhattisgarh

### I. Introduction

Agriculture is the backbone of the Indian economy. Agriculture plays a crucial role the in the livelihood of an Indian economy. The share of agriculture during the independence was almost 55% of the National GDP. But it continuously shows decreasing trend with the time, during 1980 it was 42% and now the total contribution of agriculture in GDP of India is approximately 17%. The horticultural products account about 30% of the GDP among agriculture produces. India is now in the 1<sup>st</sup> in the fruit production and it is also the 2<sup>nd</sup> highest producer of vegetable in the world next only to China. Mostly all vegetables crops like solanaceous, cucurbits, beans, cabbage, cauliflower, etc. Are grown very well in the state. The total area of vegetables crop in the state was recorded 4,89,271ha in the year 2020-21 with the production of 68,68,126 MT. Tomato is one of the most consumed vegetables in India due to its higher nutritive value an organic acid content. It is also a rich source of vitamin and it has also higher production rate and highly ecological amplitude. It is not only consumed raw, but also it is processed in ketchup, salad chatni, etc. it is known as poor man's orange it highly contains vitamin C and vitamin A.

This project study is selected with an objective to study economic analysis of Tomato in Chhattisgarh for the Bayer Crop Science. They have perfected art of breeding high quality plants use in state-of-the-art techniques. Bayer Crop Science focuses on Rice, Vegetables including Poaceae, Cucurbitaceae, Brassicaceae, Solanaceae family, Cotton to protect plant against diseases, pest, and competitive weeds, enhance their vitality and thus improve the yield both in terms of quality and quantity.

Economic analysis is the study of economic system. A systematic approach to problem of choosing best method of allocating scarce resource to given objectives. Marketing of tomato is done by middlemen present in vegetable markets who are least interested in farmers or consumer well-being. The middlemen

involved in the supply chain of tomatoes who involved in the marketing of tomato. Also, economic analysis essentially entails the evaluation of costs and benefits. The economic analysis helps to determine total cost of tomato and the price the marketers set in selling their product.

## II. Objectives of the Study

- ❖ To identify farmer profile.
- ❖ To prepare list of hybrid tomato.
- ❖ To analyse the cost of tomato cultivation in study area.
- ❖ To study the Marketing channel for tomato.

## III. Research Methodology

### 3.1 Population and Sample:

The 200 tomato growers were considered and proportionate to their percentage as per the farm size of holdings. Therefore 15 tomato growers were looking to the responses for the study. This comprised of 70 tomato growers for marginal farms, 65 for small farms, 65 for large farms respectively. The simple averages and percentage statistical tools were applied to analyze the data and report.

### 3.2 Data and sources of Data:

Primary data collected from personal visits to farmer via questionnaire method. Secondary data were collected from the government websites, company portal Since the study is aimed to finding out the economic analysis of tomato, the sample is necessarily involved the tomato grower (farmers). The study was confined to Raipur district of Chhattisgarh State because tomato was grown in both *kharif* and *rabi* season. Dhamdha was selected purposively.

## IV Research and Discussion

### 4.1 TO IDENTIFY FARMER PROFILE IN CHHATTISGARH

#### SOCIO-ECONOMIC PROFILE OF TOMATO GROWER (N=200)

Sr. No.	Variables	Category	Frequency(f)	Percentile (%)
1	Age	Young (18-35yrs)	41	20.5
		Middle (more than 36-50)	107	53.5
		Old (more than 52)	52	26.0
2	Educational Level	Up to primary	03	1.5
		Up to middle level	14	7.0
		Up to secondary level	112	56.0
		Up to higher secondary	41	20.5

		Graduate	30	15
3	Farming experience	Up to 5yrs	83	41.5
		Above 5-10yrs	52	26
		Above 10yrs	65	32.5
4	Occupational Status	Primary	183	91.5
		Secondary	17	8.5
5	Landholding	Marginal (below 1.00ha)	79	39.5
		Small (1-2ha)	48	24
		Semi-medium (2-4ha)	22	11
		Medium (4-10ha)	21	10.5
		Large ( more than 10ha)	30	15
6	Average yield	Low (up to 12ton/acre)	54	27
		Medium (up to20-25ton/acre)	96	48
		High (up to 25-40ton/acre)	27	13.5
		Very high (above 40tpn)	23	11.5
7	Adaptor	Innovator	5	2.5
		Early adaptor	27	13.5
		Early majority	68	34
		Late majority	68	34
		Laggards	32	16
8	Influential		20	10

The Above table4.1 depicts the data regarding socio economic profile of farmers. According to category Researchers distinguished the farmers into seven categories i.e., Age, Educational level, Farming experience, Occupational status, Land holding, Average yield, Annual income.

## TO PREPARE A LIST OF HYBRID VARIETIES OF TOMATO

In the Chhattisgarh, there are 12 hybrid variety of Tomato were cultivated. The list is given below

**Table 5.2: List of Hybrid tomato**

Sr. No.	Company name	Hybrid Variety
1.	Seminis	Abhilash, Saksham, Agastya, Pranay, Shivang, Virang, SVTD-8323, Ansal
2.	Syngenta	TO-3150, Sahoo, Meghdut
3.	BASF (Nunhems)	Laxmi, Rakshak , US440
4.	Nongwoo	Chandrajit
5.	Namdhari	NS-962,
6.	Clause	Sona, Darsh, Rishika, Alankar
7.	IRIS	Kartik 09, Kalyani, Nancy, Kesar, Keshav 27
8.	Noble seeds	NBH-trupti, NBH-Benaka, NBH-2424
9.	VNR seeds	Uma, VNR-4348
10.	Chia tai	Karishma, Karan
11.	Sakata	Fortuna
12.	EW	EW-815 F1 hybrid

## TO IDENTIFY COST OF CULTIVATION OF TOMATOGROWERS IN CHHATISGARH

The cost of cultivation of tomato for marginal farms is worked out in Rs/acre and presented in table 4. It clearly shows that the cost of cultivating tomato per acre in large farms was higher i.e., 8,46,391Rs than marginal farms i.e., 4,05,846Rs. And the cost cultivation for medium farms size 6,72,933Rs.

## Profitability in tomato cultivation:

The net income, benefit: cost ratio was work out in Rs/acre by farm size of holding and presented in table no. 4,6,8, respectively. It reveals that the irrespective to the farm size, the net income earned by the marginal farmer is 2,47,194 Rs. For medium farmer is 4,15,467. For large farmer the net income is 6,04,809. The B:C ratio had also been noticed with respect to farm size of holdings.

**Table 4.3: Cost of cultivation for Marginal farmer.**

Sr. No.	Particular	Unit	Qty.	Rate	Amount (Rs.)
1.	Hired human Labour				
	Male	Days	70	200	14000
	Female	Days	70	180	12600
2.	Machine charges	Hrs	8	1000	8000
3.	Machine labour	Day	1	300	300
4.	Seed cost	Gm	30	420	1260
5.	Manures	Tonn	2	2000	4000
6.	Fertilizer cost (N:P:K)				2057
7.	Plant protection				
	Fungicide@ 1000ml/ha	ML	40	0.25	100
		Gm/lit	5	79	395
	Insecticide@ 3%G	Kg	15	50	750
8.	Staking		0	0	0
9.	Irrigation charges	Rs	6	250	1500
10.	Land revenue and other	RS	0	0	0
	Cesses				
11.	Depreciation charges@ 18% on 6.5lakh	Rs			117000
12.	Interest on working capital@ 6% on cost A(1-11)	RS			9717
	Cost A				1,71,679

13.	Rental value of owned land	RS	0	0	0
14.	Interest on fixed capital@10 % on acre 20lakh	Rs			200000
	Cost B	-	-	-	3,71,679
15.	Family labour	-	-	-	
	Male	Days	40	200	8000
	Female	Days	50	180	9000
16.	Supervision charges @ 10% of cost A	Rs	-	-	17,167
	Cost C	-	-	-	4,05846

Note: fertilizers used= DAP, 12:61:0, Urea, MOP, 19:19:19.

**Yield:**

**Table 4.4: Gross Income**

Sr. No.	Item	Unit	Qty	Rate	Amount
1.	Main product (18 tonn)	Kg	16326	40	653040
2.	By product	Kg	-	-	-
	Gross income	Rs	-	-	653040

### **ANALYTICAL TOOL PER ACRE**

$$\begin{aligned} \text{Farm Business Income (F. B. I.)} &= \text{Gross income} - \text{cost A} \\ &= 6,53,040 - 1,71,679 \\ &= 4,81,361 \end{aligned}$$

$$\begin{aligned} \text{Family Labour Income} &= \text{Gross income} - \text{Cost B} \\ &= 6,53,040 - 3,71,679 \\ &= 2,81,361 \end{aligned}$$

$$\begin{aligned} \text{Net income (N. I.)} &= \text{Gross Income} - \text{Cost C} \\ &= 6,53,040 - 4,05,846 \\ &= 2,47,194 \end{aligned}$$

$$\begin{aligned}
 \text{Farm Investment Income} &= \text{Gross Income} - \text{Cost A} + \text{Value of Family Labour} \\
 &= 6,53,040 - 1,71,679 + 17,000 \\
 &= 4,64,361
 \end{aligned}$$

$$\begin{aligned}
 \text{B-C ratio} &= \text{Gross Income} / \text{Cost C} \\
 &= 6,53,040 / 4,05,846 \\
 &= 1.60
 \end{aligned}$$

### COST OF CULTIVATION FOR LARGE SCALE FARMER

Table 4.5: Cost of Cultivation of Large

Sr. No.	Particular	Unit	Qty.	Rate	Amount
1.	Hired labour	Days			
	Male (4)	Days	70	200	56,000
	Female (4)	Days	70	180	50400
2.	Machinery charges	Hrs	1	800	8000
3.	Machine labour	Rs	1	300	300
4.	Seedlings cost	Rs	8000	1.55	12400
5.	Manures	Tonn	3	2000	6000
6.	Fertilizer cost (NPK)		200:150:200		3854
7.	Plant protection				
	Chemicals				
	Fungicide@1000ml/ha	ml	600	0.25	150
	Pesticide@2gm/lit	Gm	7	79	553
	Insecticide@3% G	Kg	20	50	1000
8.	Staking (Double)	Rs	1	8000	8000
9.	Irrigation charges	Days	180	202.77	36500
10.	Land revenue & other	Rs	1	30	30
	Ceses				
11.	Depreciation	Rs	-	-	3,51,000
	charges@18% on				
	19,50,000				

12.	Interest on working capital @6% - 6 months	Rs	-	-	32,051
	Cost A	Rs	-	-	5,66,238
13.	Rental value of own land	-	-	-	-
14.	Interest on fixed capital @10% on 20lakh	Rs	-	-	200000
	Cost B	Rs	-	-	7,66,238
15.	Family labour				
	Male	-	-	-	-
	Female	-	-	-	-
16	Supervision charges @10% of Cost A	Rs	-	-	58762
	Cost C	Rs	-	-	8,25,000

**Yield:**

**Table 4.6: Gross income of large-scale farmer**

Sr. No.	Items	Unit	Qty.	Rate	Amount
1.	Main product (40)	Kg	36280	40	14,51,200
2.	Byproduct	-	-	-	
	Gross income	-	-	-	14,51,200

### **ANALYTICAL TOOL PER ACRE**

$$\begin{aligned} \text{Farm Business income (F. B. I.)} &= \text{Gross income} - \text{cost A} \\ &= 14,51,200 - 5,66,238 \\ &= 8,84,962 \end{aligned}$$

$$\begin{aligned} \text{Family Labour Income} &= \text{Gross income} - \text{Cost B} \\ &= 14,51,200 - 7,66,238 \\ &= 6,84,962 \end{aligned}$$



$$\begin{aligned}
 \text{Net income (N. I.)} &= \text{Gross Income} - \text{Cost C} \\
 &= 14,51,200 - 8,25,000 \\
 &= 6,26,200
 \end{aligned}$$

$$\begin{aligned}
 \text{Farm Investment Income} &= \text{Gross Income} - \text{Cost A} + \text{Value of Family Labour} \\
 &= 14,51,200 - 5,66,238 + 0 \\
 &= 8,84,962
 \end{aligned}$$

$$\begin{aligned}
 \text{ratio} &= \text{Gross Income} / \text{Cost C} \\
 &= 14,51,200 / 8,25,000 \\
 &= 1.7
 \end{aligned}$$

## MARKETING CHANNEL FOR TOMATO

Marketing channels can be categorized into direct & indirect channels depending on the structure of the channel.

### 1. Direct marketing Channel:



Fig. 4.1: Direct Marketing Channel

### 2. Indirect Marketing channel:

#### a) Local Marketing Channel

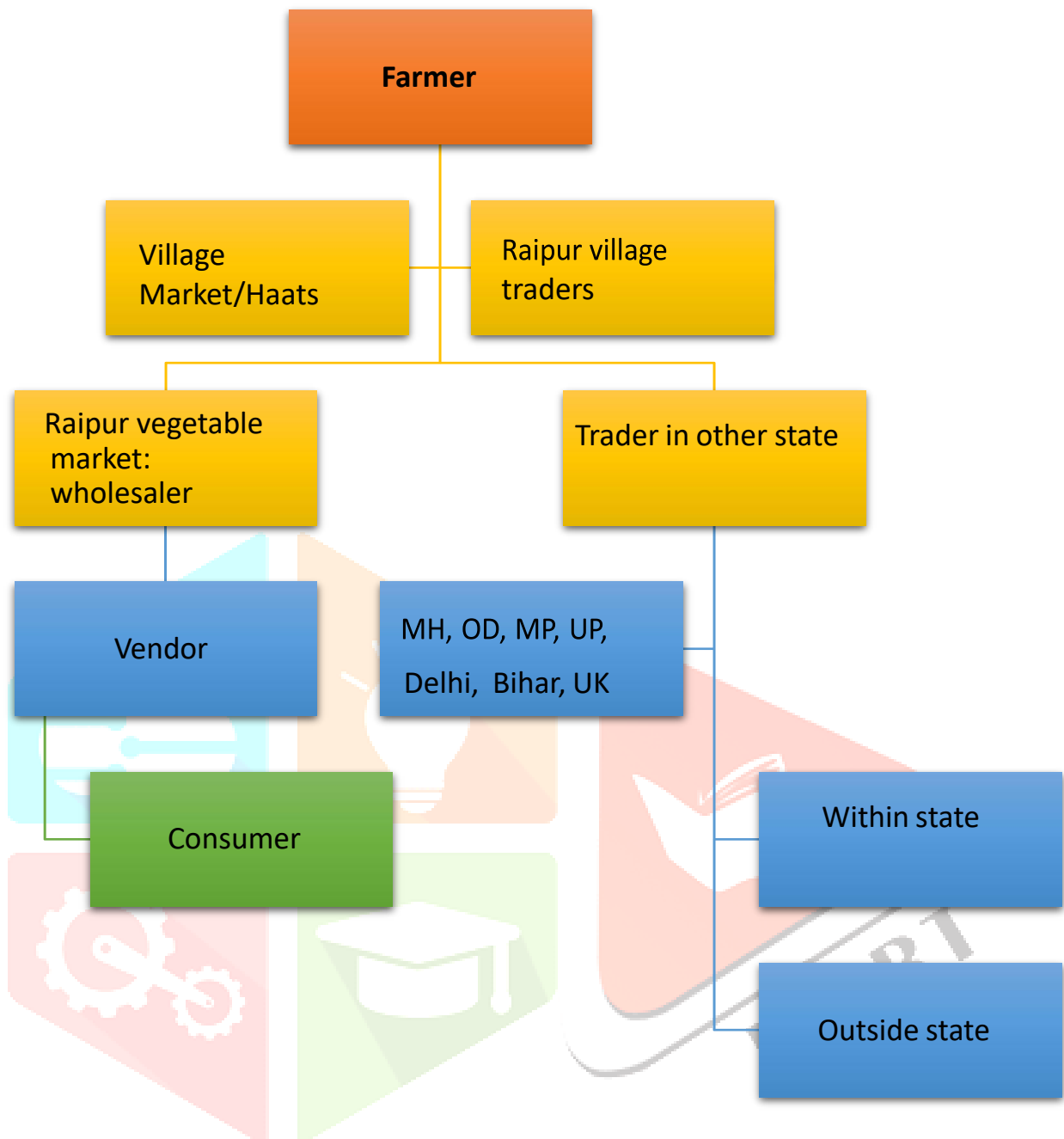


Fig. 4.2: Local Marketing Channel

#### b) Distance Sale Marketing Channel



Fig. 4.3: Distance Sale Marketing



**Fig. 4.4: Marketing channel for tomato.**

## CONCLUSION:

An analysis of survey data reveals that's the most of the farmer (90%) prefer varieties that have better keeping quality as they sold their produce to other state and that's why they are going for other varieties. The tomato cultivation is more profitable than other vegetables. So, most of the farmers cultivate tomato and the percentage is (78%). It is observed that most of the farmer does high-tech farming. Large farmer sold their produce via contractor so there is price fluctuation because it includes number of middlemen.

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