

CULTIVATION AND MARKETING OF TOMATO IN KARNATAKA

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ABSTRACT

Tomato is one of the most popular vegetables grown in India because of its high nutritive value, higher production and wide ecological amplitude. It is a rich source of vitamin and organic acid. Tomato fruits are used for different food preparations such as soups, salads, pickles, chutney, paste, puree and ketchups apart from being consumed in raw form. Tomato also has medicinal value. It is an excellent source of vitamin A and C and also called as a 'Poor man's Orange'. Tomato is an important vegetable crop and ranks third next only to potato and brinjal in the production of vegetables in the country. Vegetables, especially fruity vegetables like tomato are highly perishable and are subject to lose after harvest. There is no organized marketing system for tomato in India. A major portion of the product is still handled by the middleman. So the marketing of tomato is a complex process. It consists of all those functions and processes involved in the movement of the product from the place of production to the place of consumption. The marketing activities involve not only the functions of buying and selling, but also the preparation of produce for marketing, assembling, packaging, transportation, grading, storage, processing retailing etc. The number of functions and its type vary from product to product, from time to time and from place to place.

KEYWORDS: *Vegetables, Perishable, Marketing, Grading.*

Introduction

Agriculture is the largest and the most important sector of the Indian Economy. India has made a lot of progress in agriculture since independence in terms of growth in output, yields and area under many crops. It has gone through a green revolution, a white revolution, a brown revolution and a blue revolution. Today, India is the largest producer of milk, fruits, cashew nuts, coconuts and tea in the world, the second largest producer of wheat, vegetables, sugar and fish and the third largest producer of fish and the third largest producer of tobacco and rice. The per capita availability of food grains has risen in the country from 350 gms in 1951 to near about 400 gms per day now, of milk from less than 125 gms to 226 gms per day and of eggs from 5 to 30 per annum despite the increase in population from 35 crores to 124.72 crores (2011). At present, only 23.3 per cent of the farmers are able to derive any benefits of extension services provided by various government agencies and every year about 20 percent of the crop is lost due to mishandling, spoilage, floods, droughts, pests and diseases. In fruits and vegetables the loss is around 30 percent.

Objectives of the Study

- To examine the productivity and crop intensity of the tomato vegetable crop.
- To study the cost and income of cultivation of tomato production.
- To find out various marketing channels in tomato marketing.

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Importance in Diet

Tomato is a rich source of minerals and organic acid, essential amino acids and dietary fibers. Tomato is known as productive as well as protective food. It is a rich source of vitamin A and C, it also contains minerals like iron, phosphorus. Tomato contains lycopene and Beta-carotene pigments.

Nutritive value of Tomato

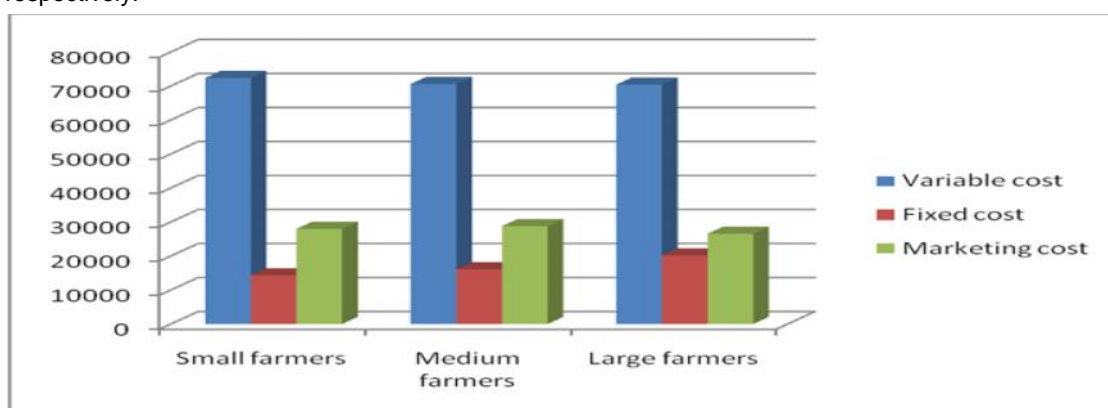
S. No.	Nutritive Constituents	Nutritive Value
1	Moisture	93.1g
2	Energy	23 K.cal
3	Protein	1.9gm
4	Fat	0.1gm
5	Carbohydrates	3.6gm
6	Fibre	0.7gm
7	Vitamin-A	320 I.u
8	b-carotene	192mg
9	Magnesium	15mg
10	Sodium	45.8mg
11	Potassium	114mg
12	Calcium	20mg
13	Iron	1.8mg
14	chlorine	38mg

Cultivation Cost of Tomato**(Rs. per acre)**

S. No.	Cost	Farmers			Pooled (Value Rs.)	Total of Pooled Category (%)
		Small	Medium	Large		
A	Variable cost					
1	Seedling	3681	3700	3868	3750	5.27
2	Farm yard manure	8196	8120	8227	8181	11.50
3	Cakes and application	6745	6177	6210	6377	8.97
4	Fertilizers	4463	3829	4746	4346	6.11
5	Red earth	850	800	780	810	1.14
6	Plant protection chemicals	4505	4365	4129	4333	6.09
7	Human labour	26000	25800	25400	25733	36.19
8	Machine hours	3063	3163	3000	3075	4.32
9	Staking sticks	5765	5798	5490	5684	7.99
10	Twines	2296	2190	2180	2222	3.12
11	Repair and maintenances of farm machinery and equipments	813	820	800	811	1.14
12	Interest on working capital @ 9 per annum	5973	5828	5565	5789	8.15
	Sub total	72351	70591	70395	71111	100
B	Fixed cost					
1	Rental value of Land	12967	14621	18882	15490	91.90
2	Depreciation on farm machinery and equipments	1164	1272	1126	1187	7.04
3	Land revenue	10	10	10	10	0.06
4	Interest on fixed assets 14% per annum	166	181	160	169	1.00
	Sub total	14307	16085	20178	16856	100
C	Cost of cultivation(A+B)	86658	86676	90573	87967	76
D	Marketing cost	28000	28800	26555	27785	24
E	Total cost (C+D)	114658	115476	117128	115752	100

The cost of cultivation and production of tomato was estimated for different farm size categories and is presented in table. It could be observed from the table that there was not much difference in per acre cost of cultivation of tomato across small, medium, and large category of respondents (Rs. 86,658, Rs. 86,676, and Rs. 90,573). Out of total cost, the variable cost amounted to Rs. 72,351, Rs.70,591, Rs. 70,395 and Rs. 71,111 for small, medium, large and pooled farm categories. The cost of seedling was

5.27 per cent of the total cost for pooled category. Wages for human labour amounted to Rs. 26,000, Rs. 25,800, Rs. 25,400 and Rs. 25,733 by small, medium, large and pooled category, respectively. Farm yard manures accounted for 11.50 per cent of the total variable cost, while oilseed cake accounted for 8.97 per cent for the pooled category. The fertilizers and plant protection chemicals shared 6.11 and 6.09 per cent respectively, while staking sticks accounted for about 7.99 per cent of variable cost. Among the various items of fixed cost, the rental value of land constituted 91.90 per cent of total fixed cost per acre. The total fixed cost of tomato for small, medium, large and pooled category was Rs. 14,307, Rs. 16,085, Rs. 20,178 and Rs. 16,856 respectively. The Marketing cost was the major item of expenditure which accounted for 24 per cent of the total cost of cultivation. The total cost incurred by small, medium, large and pooled category farmers was Rs. 1,14,658, Rs. 1,15,476, Rs. 1,17,128 and Rs.1,15,752 respectively.



Yield and Returns from Tomato Production

(Rs. per acre)

S. No.	Particulars	Small Farmers	Medium Farmers	Large Farmers	Pooled
1	Price (Rs/q)	621	630	647	624
2	Yield (q)	251	254	269	252
3	Gross returns	155871	160020	174043	157248
4	Net returns over all cost	41213	44544	56915	41496
A	Net returns over Variable cost	83520	89429	103648	86137
B	Net returns over cost of cultivation	69213	73344	83470	69281
5	Total cost	114658	115476	117128	115752

The details of yield, returns per acre and per quintal are presented in tables. The average yield of tomato was 251, 254 and 269 quintal per acre in small, medium and large farms respectively. The aggregate average yield was 252 quintal per acre. The average gross returns per acre of tomato for small, medium and large farmers were Rs.1,55,871, Rs. 1,60,020 and Rs. 1,74,043 per acre respectively. The average net returns per acre over variable cost were Rs. 83,520, Rs.89, 429 and Rs. 1,03,648 for small, medium and large farm category. The net returns over all cost (considering fixed, variable and marketing cost for small, marginal and large farmers category) was Rs. 41,213, Rs.44,544 and 56,915 per acre, respectively. The pooled category earned Rs. 86,137 net returns per acre over total variable cost. The cost of producing a quintal of tomato was Rs. 345.25, Rs.341.24 and Rs. 336.70 in small, medium and large farmers respectively. The respective net return per quintal worked out to Rs. 164.20, Rs. 175.37 and Rs. 211.58. Thus, the average cost of producing a kilo of tomato was around Rs. 4.04 excluding the cost of management.

Shift in Tomato Acreage Planted in Response to Prevailing Market Prices

Tomato being a short duration crop is highly responsive to price changes. Hence, the acreage under tomato is reported in the light of market prices during planting. Results pertaining to tomato area under different conditions presented in table shown below. The results indicated that 78.33 per cent of farmers had less than 2.5 acres of tomato in each season under normal price conditions, while, 16.67 per cent were in medium farmers category with 2.51- 5 acres and only 5 per cent had more than 5.01 acres.

S. No.	Group	During Normal Price			During High Price				During Low Price			
		No.	% to total	Avg. acre	No.	% to total	Avg. acre	% changes	No.	% to total	Avg. acre	% changes
1	Small farmers (<2.5 ac)	47	78.33	2.17	42	70	1.6	10.63	53	88.33	1.2	12.77
2	Medium farmers (2.5 – 5 ac)	10	16.67	3.3	15	25	3.3	50	5	8.33	3.2	50
3	Large farmers (>5 ac)	3	5	9	3	5	9	-	2	3.33	10	33.33

Tomato Production and Marketing Scenario

There is no organized marketing system for tomato in India. A major portion of the product is still handled by the middleman. So the marketing of tomato is a complex process. It consists of all those functions and processes involved in the movement of the product from the place of production to the place of consumption. The marketing activities involve not only the functions of buying and selling, but also the preparation of produce for marketing, assembling, packaging, transportation, grading, storage, processing retailing etc. The number of functions and its type vary from product to product, from time to time and from place to place. A study of the agricultural marketing system is necessary to understand the complexities involved and the identification of bottlenecks with a view of providing efficient services in the transfer of farm products and inputs from producers to consumers. An efficient marketing system minimizes costs and increases the benefits of all the sections of the society. The following elements are involved in tomato production and marketing.

- **Producers:** Farmers want the marketing system to purchase their produce without loss of time and provide the maximum share in the consumer's rupee. They want the maximum possible price for their surplus produce from the system. Similarly, they want the system to supply them the inputs at the lowest possible price.
- **Consumers:** The consumers of tomato products are interested in a marketing system that can provide tomato and other items in the quantity and of the quality required by them at the lowest possible price. However, this objective of marketing for consumers is contrary to the objective of marketing for the farmer producers.
- **Market Middlemen and Traders:** Market middlemen and traders are interested in a marketing system which provides them a steady and increasing income from the purchase and sale of tomato. This objective of market middlemen may be achieved in purchasing the tomato products from the farmers at low prices and selling them to consumers at high prices.
- **Co-operative and Private Vegetables Organization:** Private and co-operative vegetable producers, purchase-sale agencies are made available in Kolar district. Good remunerative prices are obtained through transporting the crop to metropolitan cities. They have successfully operated in the up-country market.

Dynamics and Integration of Markets

Integration of tomato markets was studied by considering Kolar and Vaddahalli APMC markets. Kolar market is one of the leading tomato markets in Karnataka as compared to Vaddahalli market. The arrivals of tomato in Kolar market was more in summer season (250183 MT) followed by kharif season (70589 MT) and winter season (27299 MT). On the other hand Vaddahalli market had higher arrivals during kharif as compared to the other seasons. The daily arrivals in Kolar market was more than 1200 qtl during peak periods and less than 700 qtl during the period of low arrivals, while Vaddahalli market had 600 qtl arrivals daily. There were 250 traders in Kolar market while, Vaddahalli had only 40 traders handling tomato. Concentration of sellers and buyers were high in Kolar market. The top 5 traders in Kolar market handled more than 60 per cent of tomatoes arrived in the market during kharif and rabi seasons. In Vaddahalli market, the top 5 traders handled on an average 74.22 per cent of tomato in the market. In Vaddahalli market there is huge arrivals of local variety of tomato due to demand from Andhra Pradesh and Tamil Nadu markets. Arrivals in Kolar market was from Kolar, Chikkaballapur, Shidlagatta, K.G.F, Chintamani,

Bangalore rural. While in Vaddahalli market, arrivals were from Kolar, Vaddahalli local, Chintamani, Tamballi, V.Kota, and Punganoor. In Kolar tomato market there was no collusion among traders because of adoption of fair marketing practices. In Vaddahalli a few of tomato growing farmers have become traders in APMC and brought about competitiveness in price determination. Normally 3 crops of tomato is taken up in a year. Kharif crop is grown in June- September months is harvested upto August-December. The rabi tomato transplanted in October- December could be harvested in January-March. Summer crop planted in January- March is harvested upto April- June. Tamil Nadu and Andhra Pradesh have not much demand for Karnataka tomato during January to March. The excessive dependence on upcountry markets makes Kolar market highly vulnerable to price volatility.

Findings

- The total cost of cultivation of tomato for small, medium, large and pooled category of respondents was Rs. 1,14,658, Rs. 1,15,476, Rs.1,17,128 and Rs. 1,15,752 per acre respectively. The variable costs amounted to Rs. 72,351, Rs. 70,591, Rs. 70,395 and Rs. 71,111 respectively.
- The per kilo average cost of production was Rs. 4.56 for small farmers as compared to 4.35 for large farmers.
- The average gross returns of tomato for small, medium and large farmers were Rs. 1,55,871, Rs. 1,60,020 and Rs. 1,74,043 per acre respectively.
- Cost and return analysis for small, medium and large category of farmers indicate direct relationship between area under tomato crop and the total cost of cultivation. Large farmers total cost of cultivation was relatively less, when compared to small farmers. The yield of tomato per acre showed a direct relationship with the area under tomato for small, medium and large farmer.
- The Co-integration analysis revealed a simultaneous feedback in prices of Kolar market had greater influence on Vaddahalli market prices.
- Vaddahalli market prices were integrated with Kolar market prices. Thus, the prices of Kolar market influence prices in Vaddahalli market in the short run. Tomato is highly price sensitive due to high fluctuations in supply. Though there is strong integration between markets, the benefits of integration are not being reaped by farmers as tomato crop is highly perishable. Therefore, the benefit of integration goes to traders.

Conclusion

It is a fact that there is no certain, stable and regular marketing structure in tomatoes growing in real world due to the characteristics of agricultural products. Therefore, farmers can face some risk and uncertainties during the tomatoes growing. When bottleneck happened in the export of tomatoes, producers are under control of middlemen in the determination of tomatoes price. This causes not selling of tomatoes at desirable price and decrease in the income of the farmers. As a result, some farmers give up tomatoes production in the coming years. The Karnataka Government has introduced the Karnataka Agriculture Marketing Policy 2013. The overall objective of this policy is to create a market structure that is transparent and equitable, distinguishes quality and variety, disseminates relevant market information to all market participants for a level playing field, provides easy access to all participants and ensures fair returns to all stakeholders, with the seller having the choice to decide the time, place and avenue of sale.

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