

A Study of Farmers' Attitude and Intention To Cultivate Tomato For Sustainable Development

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Abstract

Agriculture has an important role to play in the economic development of an agrarian economy like India. It is crucial to the farmers to make informed decisions about what to grow, when to harvest. The objectives of the present study are: to examine the reason for cultivating tomato; to analyse the cost of production in tomato cultivation; and to know the relationship between input and output of tomato cultivation. The study focuses the farmers' attitude and intention to cultivate tomato for sustainable development. The study was conducted in Coimbatore district with the sample size of 342 respondents during the year 2014. The area under tomato cultivation has more in Coimbatore district. The study suggests that the growers of tomato may be encouraged to adopt some measures for value addition, including grading and standardization of the produces according to size, shape and degree of ripeness/maturity. Such a step many help the growers to get different rates for different grades instead of selling of one common lot, which led to lower returns to growers. The inadequacy of processing units in the area under study is considered as one of the major constraints in marketing of tomato. There is urgent necessity of establishing processing units in the areas producing surplus tomatoes. The processed tomato products can be supplied in local markets.

Key words:Tomato marketing, agricultural marketing, vegetable marketing, sustainable agricultural development, rural development, etc.

1. Introduction

Agriculture has an important role to play in the economic development of an agrarian economy like India. The emerging areas in agriculture like horticulture, floriculture, organic farming, genetic engineering, food processing, branding and packaging have high potentials for growth. In Tamil Nadu, the major vegetable crops are tapioca, onion, tomato, brinjal, potato, lablab, drumstick, etc. Out of 11.08 lakhs hectare of horticultural crops in Tamil Nadu, vegetable crops are cultivated in 2.84 lakhs hectare accounting for 25.63 per cent. India has witnessed increase in horticulture production over the last few years. Over the last

decade, the area under horticulture grew by 2.6% per annum and annual production increased by 4.8%. During 2017-2018, the production of horticulture crops was 311.71 million tonnes from an area of 25.43 million hectare. According to horticultural statistics in Coimbatore district, fruit production of 2005-06 was 10,000 hectare and in 2009-10 the production was increased to 13,000 hectare. But in the year 2013-14, it has drop down to 11,500 hectare. In vegetable production of 2005-06 was 7,800 hectare and in 2009-10 the production was decreased to 6,500 hectare. But in the year 2013-14 it has come down to 5,200 hectare. It is crucial to the farmers to make informed decisions about what to grow, when to harvest. In other hand, there are many tomato growing belts in Coimbatore and lack of infrastructure facilities in Coimbatore leads to more and more post-harvest losses in tomato.

2. Review of literature

Destagiri, et al. (2010) compared the public markets (Ryathu bazaars) in operation in Andhra Pradesh with the new generation private retail markets like Reliance Fresh and Subhiksha. The study concluded that the marketing models of private agencies, particularly Reliance Fresh and Subhiksha were more efficient than that of Ryathu bazaar, due to their low cost of marketing, transport and incidental charges.

Khem Chand (2010) studies the marketing of fruits and vegetables in Jaipur and Sriganganagar districts of Rajasthan. Sample size was kept uniform for all fruits and vegetables crops. For each crop 120 farmers were selected. Beside this, information was also collected from 30 wholesalers/traders/contractors and 30 retailers for each fruits and vegetables crop under study. The strategies to enhance marketing efficiency of fruits and vegetables vary according to nature of produce and kind of marketing facilities in a particular region.

Samuel Asgedom, et al. (2011) studied the opportunities and constraints of tomato production in Eritrea with the sample size 146 tomato farmers. The study revealed that there is no well-established seed system in Eritrea, which could

assist farmers to select, maintain and use high-yielding, stable and diseases-resistant varieties. More varieties have to be identified and released to farmers along with demonstration of varieties accompanied by agro- packages. Introduction of low tunnels and walk-in tunnels for nursery and off-season production of tomatoes could ensure year-round availability of tomatoes and stabilize their price.

SalihKheiralla Hussein (2013) studied the marketing margin and pricing efficiency analysis of tomato production in Sudan. The study reveals that the sampled respondents had a marketing margin estimated at (2.69SG/kg), (2.33SG/kg) and (1.97SG/kg) for wholesalers and (0.77SG/kg), (0.67SG/kg) and (0.75SG/kg) for retails in Kharteoum, Madani and Sinnar, respectively. The study further reveals that, the problem of transportation can be tackled through regular maintenance of roads, provision of alternative transportation means. This will reduce the damages caused by poor roads and also stabilize the price of tomato.

3. Objectives of the study

1. To examine the reason for cultivating tomato.
2. To analyse the cost of production in tomato cultivation.
3. To know the relationship between input and output of tomato cultivation.

4. Scope of the study

India being in net producer of agricultural commodities the fresh earnings by way of marketing will lead to the export of agricultural goods which will have way for the increased investment resulting in technological advances eventually leading to improved productivity and efficiency to accelerate the pace of economic development. In past one decade in Coimbatore district, there is a deceleration of growth in agriculture. However, it is not uniform and there are three areas that still hold promise for stimulating the growth. The study focuses the farmers' attitude and intention to cultivate tomato for sustainable development.

5. Research design

The study was conducted in Coimbatore district with the sample size of 342 respondents during the year 2014. The area under tomato cultivation has more in Coimbatore district. Hence, it is necessary to know the production and marketing of this crop in this area. List of blocks where tomato cultivation is concentrated has been obtained from the Coimbatore district. Area details. The areas of cultivation in Kinatukadavu block 614 hectares which was 30.65 per cent, Madukarai block 664 hectares which was 33.15 per cent and Thondamuthur block 291 hectares which was 14.53 per cent. At the second stage, the number of farmers cultivated tomato were obtained with the help of Block Development Office which was 1741 farmers in Coimbatore district. Out of this proportionately selected samples based on the area under tomato cultivation which was 1364 farmers. The researcher has selected 25 per cent of the proportionate sample population for the study purpose. They were 134 respondents (25 per cent) out of 534 farmers from Kinatukadavu Block, 145 respondents (25 per cent) out of 577 farmers from Madukarai Block and 63 respondents (25 per cent) out of 253 farmers from Thondamuthur Block using proportionate random sampling method. Collected data were analysed with reference to each of the specific objectives of the study. Tools like simple percentage analysis, chi-square test and inter correlation matrix were used.

6. Analysis and interpretation

Table 1

Area, Production and Productivity of Tomato in India

| Year | Area (In ' 000 Hectare.) | Production (In ' 000 MT) | Productivity (In MT/Hectare.) |
|-----------|--------------------------------|-----------------------------|----------------------------------|
| 2009-2010 | 634.4 | 12433.2 | 19.6 |
| 2010-2011 | 865 | 16826 | 19.5 |
| 2011-2012 | 907.1 | 18653.3 | 20.6 |
| 2012-2013 | 879.6 | 18226.6 | 20.7 |
| 2013-2014 | 882 | 18736 | 21.2 |
| 2014-2015 | 767.32 | 16384.98 | 21.35 |

| | | | |
|-----------|--------|----------|-------|
| 2015-2016 | 773.88 | 18731.97 | 24.21 |
| 2016-2017 | 796.86 | 20708.43 | 25.99 |
| 2017-2018 | 789.15 | 19759.32 | 25.04 |

Source: Horticulture Statistics Division, Department of Agri. & Cooperation.

The study concluded that when the productivity of tomato is compared with the year 2009-2010 (19.6 MT/Hec) and the year 2017-2018 (25.04MT/Hec), it was increasing. The productivity of tomato is compared with the year 2016-2017 (25.99MT/Hec) and the year 2017-2018 (0.95MT/Hec) it was decreasing.

Table 2

Variety of Tomato Cultivated by the Farmers

| S. No. | Variety | No. of Farmers | Percentage |
|--------|--------------|----------------|------------|
| 1 | US618 | 20 | 5.8 |
| 2 | US404 | 22 | 6.4 |
| 3 | Mahalakshmi | 38 | 11.1 |
| 4 | Lakshmi 5005 | 50 | 14.6 |
| 5 | Namuthari | 63 | 18.4 |
| 6 | Avathar | 4 | 1.2 |
| 7 | Others | 145 | 42.4 |
| Total | | 342 | 100.0 |

Table 2 describes the variety of tomato cultivated by the farmers. Out of 342 farmers surveyed, 18.4 per cent of the farmers have cultivated Namuthari variety of tomato, 14.6 per cent of the farmers have cultivated Lakshmi 5005 variety of tomato, 11.1 per cent of the farmers have cultivated Mahalakshmi variety of tomato, 6.4 per cent of the farmers have cultivated US404 variety of tomato and 5.8 per cent of the farmers have cultivated US618 variety of tomato.

Table 3***Reason for Cultivating Variety of Tomato***

| S. No. | Reasons | No. of Farmers | Percentage |
|--------|-----------------------------|----------------|------------|
| 1 | Type of soil | 13 | 3.8 |
| 2 | High yield | 99 | 28.9 |
| 3 | Get yield in short duration | 72 | 21.1 |
| 4 | More sour taste | 11 | 3.2 |
| 5 | Same size till last stage | 147 | 43.0 |

From the above table, it is inferred that, 43 per cent of the farmers have cultivated different variety to get same size of tomato till last stage, 28.9 per cent of the farmers have cultivated a different variety of tomato in order to get high yield, 21.1 per cent of the farmers have cultivated a different variety of tomato to get yield in short duration, 3.8 per cent of the farmers have cultivated a different variety of tomato as it suits to the type of soil and 3.2 per cent of the farmers have cultivated a different variety of tomato in order to get more sour taste. The study shows that most of the farmers (43 per cent) have cultivated a different variety, to get same size of tomato till last stage.

In order to test whether there is any significant association between the experience in cultivation and the reasons for cultivating different variety of tomato among the farmers a suitable hypothesis is formulated and tested with the statistical tool chi-square.

Table 4***Experience in Cultivation and Reasons for Cultivating Variety of Tomato***

| S. No. | Reasons | Experience in Cultivation | | | Total |
|--------|-----------------------------|---------------------------|---------|---------|-------|
| | | Minimum | Average | Maximum | |
| 1 | Type of soil | 6 | 4 | 3 | 13 |
| 2 | High yield | 51 | 26 | 22 | 99 |
| 3 | Get yield in short duration | 18 | 30 | 24 | 72 |

| | | | | | |
|---|---------------------------|----|----|----|-----|
| 4 | More sour taste | 4 | 0 | 7 | 11 |
| 5 | Same size till last stage | 45 | 55 | 47 | 147 |

The chi-square result shows that the calculated value is 24.637 which is more than the table value 15.5. Since the calculated value is more than the table value, the hypothesis is rejected. So, it is inferred that there is significant association between the experience in cultivation and the reasons for cultivating variety of tomato among the farmers.

Table 5

Experience in Cultivation and Type of Cultivation

| S. No. | Type of Cultivation | Experience in Cultivation | | | Total |
|--------|---------------------|---------------------------|---------|---------|-------|
| | | Minimum | Average | Maximum | |
| 1 | Seedling | 90 | 50 | 61 | 201 |
| 2 | Plantation | 31 | 59 | 38 | 128 |
| 3 | Both | 3 | 6 | 4 | 13 |
| Total | | 124 | 115 | 103 | 342 |

The chi-square result shows that the calculated value is 20.877 which is more than the table value 9.49. Since the calculated value is more than the table value, the hypothesis is rejected. So, it is inferred that there is significant association between experience in cultivation and type of cultivation followed by the farmers.

7. Cost of cultivation of tomato farmers

To study the variability of cost of cultivation, the items are grouped into five namely, seed/saplings, fertilizers (nitrogen, phosphorus and potash), pesticides, man power (land preparation, land level/ manure application, transplantation, irrigation, weeding and staking, pesticide application and harvesting) and other expenses (transportation, stakes, sprayer hire and tractor/ploughing) and furnished below.

Table 6**Cost of Cultivation****(inRs./ Per acre)**

| S. No | Items | Min. value | Max. value | Mean | SD | CV |
|-------|----------------|------------|------------|----------|---------|-------|
| 1 | Seed/ Saplings | 3500 | 6300 | 4903.65 | 712.13 | 14.52 |
| 2 | Fertilizer | 3000 | 8100 | 5860.98 | 1201.90 | 20.51 |
| 3 | Pesticides | 4000 | 10000 | 6313.57 | 1425.85 | 22.58 |
| 4 | Man power | 20000 | 45800 | 34814.98 | 6330.31 | 18.18 |
| 5 | Other expenses | 17650 | 48270 | 33015.69 | 7912.75 | 23.97 |

It is inferred from the above table that the amount towards seed/sapling ranges from Rs.3500 to Rs.6300 per acre, the amount towards fertilizers ranges from Rs.3000 to Rs.8100 per acre, the amount towards pesticides ranges from Rs.4000 to Rs.10000 per acre, the amount towards man power ranges from Rs.20000 to Rs.45800 per acre and the amount towards other expenses ranges from Rs.17650 to Rs.48270 per acre. The mean amount of manpower is higher (Mean-Rs.34814.98), the mean amount of other expenses is Rs.33015.69, the mean amount of pesticides is Rs.6313.57, the mean amount of fertilizers is Rs.5860.98 and the mean amount of seed/sapling is lower (Mean-Rs.4903.65). The coefficient of variation of seed/sapling is lower (CV-14.52 per cent), the coefficient of variation of man power is 18.18 per cent, the coefficient of variation of fertilizers is 20.51 per cent, the coefficient of variation of pesticides is 22.58 per cent and the coefficient of variation of other expenses is higher (CV-23.97 per cent). The study concluded that an average cost of cultivation of tomato per acre amount of Rs.84908.87. The coefficient of variation of seed/ sapling is lower (CV-14.52 per cent) and it said to be more uniform when compared to other costs. The coefficient of variation of other expenses namely transportation, stakes, sprayer hire and tractor/ploughing are higher (CV-23.97 per cent) and it is said to be more variable when compared to other costs.

8. Relation between output and inputs

In order to study the quantum, as well as the direction of relationship between any two variables the inter-correlation matrix of a dependent variable (Y)-Yield with a set of independent variables (X_i s) Seed Rs/Acre-X1, Fertilizer Rs/Acre -X2, Pesticide Rs/Acre -X3, Manpower Rs/Acre -X4 and other expenses Rs/Acre -X5 are obtained and furnished below:

Table 7

Inter-correlation Matrix

| Variables | X1 | X2 | X3 | X4 | X5 | Y |
|-----------|--------|--------|--------|--------|--------|------|
| X1 | 1.00 | | | | | |
| X2 | 0.25 | 1.00 | | | | |
| X3 | 0.43 | 0.17 | 1.00 | | | |
| X4 | 0.68 | 0.36 | 0.68 | 1.00 | | |
| X5 | 0.70 | 0.28 | 0.73 | 0.87 | 1.00 | |
| Y | 0.70** | 0.26** | 0.78** | 0.94** | 0.91** | 1.00 |

** Significant at 1 % level

There is inter-correlation between the independent variables namely Seed-X1, Fertilizer-X2, Pesticide-X3, Man power-X4 and other expenses-X5 and dependent variable. All the explanatory variables are significantly correlated with the dependent variable Y (i.e.) yields. The inputs namely seed, fertilizer, pesticide, man power and other expenses are highly significantly positively correlated with the yield of tomato which indicates higher these inputs will result in higher yield. Further, dosage in fertilizer and pesticides will result in higher yield. The other expenses namely transportation, stakes, sprayer hire and tractor/ ploughing also positively contributes to the yield of tomato.

9. Findings

1. Most of the farmers (18.4 per cent) have cultivated Namuthari variety of tomato and most of the farmers (43 per cent) have cultivated a different variety, to get same size of tomato till last stage.
2. There was significant association between experience in cultivation and the reasons for cultivating different variety. There was significant association between experience in cultivation and the type of cultivation followed by the farmers.
3. An average cost of cultivation of tomato per acre amounts to Rs.84908.87. The coefficient of variation of seed/sapling is lower (CV-14.52 per cent) and it said to be more uniform when compared to other costs. The coefficient of variation of other expenses namely transportation, stakes, sprayer hire and tractor/ploughing are higher (CV-23.97 per cent) and it is said to be more variable when compared to other costs.
4. The inputs namely seed, fertilizer, pesticide, man power and other expenses are highly significantly positively correlated with the yield of tomato which indicates higher these inputs higher is yield. Further, dosage in fertilizer and pesticides will result in higher yield. The other expenses namely transportation, stakes, sprayer hire and tractor/ ploughing also positively contributes to the yield of tomato.

10. Suggestions

There is urgent need to establish cold storage facilities at the assembling market places. Due to lack of cold storage facilities near the growing areas, the tomato farmers had to sell their produce immediately after harvest at a lower price. So, the expansion of cold storage facilities in the vegetables growing areas should receive priority. The growers of tomato may be encouraged to adopt some measures for value addition, including grading and standardization of the

produces according to size, shape and degree of ripeness/maturity. Such a step many help the growers to get different rates for different grades instead of selling of one common lot, which led to lower returns to growers. The inadequacy of processing units in the area under study is considered as one of the major constraints in marketing of tomato. There is urgent necessity of establishing processing units in the areas producing surplus tomatoes. The processed tomato products can be supplied in local markets.

11. Conclusion

The study has highlighted that the farmers' attitude and the intention to cultivate tomato. The study has adequately focused on the establishment of processing industry in Coimbatore district for the sustainable development and emerging challenge of global business in tomato market.

12. Reference

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