

Analysis of Growth Rates and Instability of Export of Tomato and its products from India

Abstract

The study explores the analysis of the growth rates and instability of tomato area, production, and export of tomato and its products from India, during the study period of 2001-2002 to 2019-2020. It was based on secondary data. The period of the study was 20 years, which was divided into three periods i.e., Period I (2001-2002 to 2009-2010), Period II (2011-2012 to 2019-2020) and overall period (2001-2001 to 2019-2020). The data collected from various publications including FAO, Indiastats, APEDA and APMC, various publications. Collected. The data was analysed with the help of analytical tool i.e., compound growth rate, (CGR) and coefficient of variation (CV). used to fulfil the objectives of the study. In overall period, positive growth rate (CGR) and significant was observed in area, production, export quantity of tomato, export and value of tomato of tomato, export quantity of tomato paste, export quantity of tomato peeled and export value of tomato peeled, with CGR of {3.66, 6.58, 8.06, 3.60, 10.46, 4.34 and 1.06 percent, respectively. The export of tomato juice and export of tomato paste was showed negative growth rate and non-significant. During overall period, the higher coefficient of variation (CV%) was high was observed in export quantity of tomato juice, tomato peeled, tomato paste and fresh tomato with CV of {145.56, 91.35, 82.87 and 82.97 percent respectively}. The lower (CV%) was observed in area, and production with a value of {23.53 and 36.56 per cent, respectively}. The result was concluded that the tomato and its products have better export potential in future.

Key words: compound growth rate, Instability, coefficient of variation, Export.

INTRODUCTION

Tomato (*Solanum lycopersicum*) is most important vegetable crop, in India and worldwide. It belongs to Solanaceae family, (Solanaceae) originated in South America. Tomato is widely used vegetable and consumed as both raw and cooked form, and also in the form of processed products. of tomato also. It is a short duration vegetable crop, botanically it is fruit for the purpose of trade.

Tomato is protective supplementary food is called as poor man's orange. India ranks second within its area moreover as the production of tomatoes after China, within the world. In India, tomato rank third after potato and onion. The majority of tomatoes are produced in India are consumed as fresh as well as processed products. also.

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Around 80% of the tomatoes are consumed fresh and 20% of tomatoes are used for processing. Processed products of tomatoes are tomato paste, tomato juice, tomato peeled, etc. The growing season of tomato in India is throughout the year because of the increasing demand for tomatoes within the market. The foremost important tomato growing states in India are Andhra Pradesh, Madhya Pradesh, Karnataka, Gujarat and Odisha. Andhra Pradesh is the major state in terms of area as well as production of tomatoes in India. During the year 2019-2020 area of tomato cultivation was 61.00 thousand hectare and production of tomato was 2810.00 thousand MT. Andhra Pradesh shares 20.2 percent of tomato production to the country. India contributes to more than 11 percent of the world's total tomato production. The total cultivated area of tomato in India during a year 2019-2020 was (8,13,000 ha), and tomato production in India during a year 2019-2020 was (20,57,300 tonnes). India is one of the major exporters of tomatoes, from India. India which exports tomatoes to more than 50 countries. During the year 2019-2020, India exported tomatoes export quantity 93,621.53 tonnes with an export value in of Rs. 22,259.85 Lakhs. And during the year 2019-2020, India exported tomatoes export quantity 93,621.53 tonnes, export value in Rs 22,259.85 Lakhs. (www. Source from-fao.org).

Objectives of the study

1. To estimate the growth in area, production, and export of tomatoes and export of tomato products, and 2. To work out the instability in area, production, and export of tomatoes and export of tomato products.

Research Methodology

Nature and Source of data.

The present study was based on secondary data. The secondary data was collected from Agricultural and Processed Food Products Export Development Authority (APEDA), Food and Agricultural Organization (FAO), Indian Agristat, Agricultural Produce Marketing Committee (APMC), various

Period of study

The data regarding area, production, export quantity and export value of tomatoes of Tomatoes and export quantity of Tomato products, export and value of tomato products in India was collected from 2001-2002 to 2019-20. This includes 20 years of data. The period has been divided into two-three periods.

Period I (2001-2002 to 2009-2010)

Period II (2011-2012 to 2019-2020)

Overall period (2001-2002 to 2019-2020)

Analytical tools and techniques.

The data was collected from secondary source subjected to appropriate analytical techniques in order to arrive at a meaningful conclusion.

The different analytical technique used for the study were were

Growth rate analysis and Instability analysis

1) Growth rate analysis.

The growth rate of area, production, export of tomato and its products in from India will be studied by using compound growth rates. The growth rate will be estimated using following model

$$Y = a \cdot b^t \dots\dots\dots (1)$$

Y = Dependent variable for which growth rate was to be estimated i.e

(Export/Area / Production and Export.

A = Intercept

B = Regression Coefficient

T = Time Variable

This equation will be estimated after transforming (1) as follows,

$$\log y = \log a + t \log b \dots\dots\dots (2)$$

Then the percent annual compound growth rate will be computed by using the relationship.

$$CGR = [\text{Antilog}(\log b) - 1] \times 100 \dots\dots\dots (3)$$

The significance of the regression coefficient will be tested using the 't' test.

2) Degree of instability

In order to study the instability in the export performance of tomatoes and its products coefficient of variation will be used.

Coefficient of variation (CV):

$$\text{Coefficient of Variation (CV)} = (\sigma / \bar{x}) * 100$$

σ = Standard deviation,

\bar{x} = Arithmetic mean,

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export value was -6.68 percent per annum. The And tomato peeled export quantity was 8.81 percent per annum and export value was 9.12 percent per annum.

Table 4. Revealed that the export quantity of tomato juice exhibited highest variation of 137.26 percent in period II and less variation of 107.52 percent in period I and overall period with co-efficient of variation at 145.56 percent. Export value of tomato juice was showed highest variation in period II i.e., that is 86.74 percent, and less variation in period I was with 43.98 percent and overall period with co-efficient of variation at 65.39 percent.

The export quantity of tomato paste showed highest variation of 82.47 percent in overall period compared to period I and period II i.e., that is 38.45 percent and 54.22 percent, respectively. Export value of tomato paste was exhibited highest variation of 59.21 percent in period I and less variation of 30.77 percent in period II and overall period with co-efficient of variation at 51.82 percent.

The export quantity of tomato peeled showed highest variation of 91.35 percent in overall period as compared to period I and period II i.e., that is 54.20 percent and 77.22 percent, respectively. Export value of tomato peeled showed highest variation of 66.54 percent in period II and less variation of 51.16 percent in period I and overall period with coefficient of variation at 57.39 percent.

variation at 71.77 percent.

It was concluded that based on the result showed in overall period of study that the coefficient of variation was found less in area, production, of tomato, and export value of tomato, than the export quantity of tomatoes. And The export quantity of Tomato juice, Tomato paste, Tomato peeled were exhibited as high variation with coefficient of variation than Export value of Tomato juice, Tomato peeled, and Tomato paste.

Conclusion

The present Study was undertaken to analyse the compound growth rates, during the study periods have shown positive and significant. The study revealed that there is a scope to increase the export of tomatoes and its products. The high instability with coefficient of variation in Tomato juice, paste, peeled and Tomatoes than its Area and production. Processing of tomatoes and Export of tomato products in India is less than other countries. So that there is need to improve the technology and more facilities for processing. Most of the tomato varieties grown in India used for table purposes, less varieties of tomatoes were used for processing. So, there is need to improve more tomato varieties for processing purpose.

Table 1. Compound Growth rates of Area, Production and Export of Tomatoes.

S.No	Particulars	Period I	Period II	Overall Period
1	Area	3.85	-1.47	3.66*
2	Production	6.10	1.68	6.58*
3	Export quantity	0.08	7.73	8.06*
4	Export value	-1.88	-4.33	3.60*

Note: * denotes significant at 1% level.

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Table 2. Compound Growth rates of Export of Tomato Products.

S.No.	Particulars	Period I	Period II	Overall Period	
1	Tomato juice	Export quantity	-12.96	1.26*	-1.28
		Export value	3.99*	-1.35	-17.06
2	Tomato Paste	Export quantity	8.37*	2.42*	10.46*
		Export value	-6.68	5.74*	-1.10
3	Tomato Peeled	Export quantity	8.81*	-19.81	4.34*
		Export value	9.12*	13.61*	1.06*

Note: * denotes significant at 1% level

Table 3. Degree of Instability in Area, Production, Export quantity and Export value of tomatoes.

S.No.	Particulars	Parameters	Period I	Period II	Overall Period
1	Area	Mean	533710	825503	679606.5
		SD	62858.19	52412.77	159934.20
		CV%	11.77	6.34	23.53
2	Production	Mean	9242.36	18805.81	14024.08
		SD	1712.72	1327.72	5127.66
		CV%	18.53	7.06	36.56
3	Export quantity	Mean	20600.77	47502.26	34051.51
		SD	20106.82	29648.75	28254.90
		CV%	97.60	62.41	82.97
4	Export value	Mean	24683.31	39748.68	32216.00
		SD	21859.28	22910.35	23123.51
		CV%	88.55	57.63	71.77

Table 4. Degree of Instability in Export of Tomato Products.

S.No.	Particulars	Parameters	Period I	Period II	Overall Period

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1	Tomato juice	Export quantity	Mean	36.9	86.4	61.65
			SD	39.67	118.59	89.73
			CV%	107.52	137.26	145.56
		Export value	Mean	44457.08	23489.19	33973.13
			SD	19555.51	20376.51	22215.26
			CV%	43.98	86.74	65.39
2	Tomato Paste	Export quantity	Mean	109.9	392.7	251.3
			SD	42.25	212.95	208.26
			CV%	38.45	54.22	82.87
		Export value	Mean	42754.28	32373.04	37563.66
			SD	25318.2	9963.43	19468.43
			CV%	59.21	30.77	51.82
3	Tomato peeled	Export quantity	Mean	176.60	455.10	315.85
			SD	95.72	351.43	288.54
			CV%	54.20	77.22	91.35
		Export value	Mean	52475.58	48932.37	50703.97
			SD	268484.85	32562.52	29103.60
			CV%	51.16	66.54	57.39

Note: SD-Standard Deviation and CV- Coefficient of Variation.

(Source: www.faostat.fao.org), (Export Quantity in tonnes, export value in Rs. lacs)

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