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, during the study period of 2001-2002 to 2019-2020.It was based on secondary data, Period of the study was 20 years it divided into three periods i.e., Period I (2001-2002 to 2009-2010), Period II (2011-2012 to 2019-2020), overall period (2001- 2001 to 2019-2020). The data collected from FAO, Indiastats, APEDA, APMC, various publications. Collected data 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. Overall period positive growth rate (CGR) and significant was observed in Area, Production, Export quantity and value of tomato, Export quantity of tomato paste, Export quantity and value of tomato peeled, (3.66,6.58,8.06,3.60,10.46,4.34,1.06 percent respectively) and export of tomato juice export of tomato paste was negative growth rate and non- significant. During overall period the Coefficient of variation (CV%) was high was observed in export quantity of tomato juice, tomato peeled tomato paste and fresh tomato (145.56,91.35,82.87,82.97 percent respectively). low (CV%) was observed in Area, and Production (23.53, 36.56 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. Family (Solanaceae) origin South America.Tomato is widely used vegetable and consumed as both raw and cooked form, and Processed products of tomato also. It is a short duration vegetable crop, botanically it is fruit for the purpose of trade.

Around 80% of the tomatoes are consumed fresh and 20% of tomatoes are used for processing. Processed products of tomatoes

Tomato is protective supplementary food is called as poor man's orange. India ranks second within the 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.

Period of study

The data regarding Area, production, export quantity, export value of Tomatoes and

are tomato paste, tomato juice, tomato peeled, etc. growing season of tomato in India is throughout the year because of the increasing demand for tomatoes within the market. The foremost tomato growing states in India are Andhra Pradesh, Madhya Pradesh, Karnataka, Gujarat, Orissa. Andhra Pradesh is that the major state that area as well as production of tomatoes in India. During the year 2019-2020 area of tomato cultivation is 61.00 thousand hectare and production of tomato is 2810.00 thousand MT. Andhra Pradesh shares 20.2 percent of tomato production. 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 (813000 ha), and tomato production in India.During a year 2019-2020(2057300tonne). India is one of the major exporters of tomatoes from India. India exports tomatoes to more than 50 countries. During the year 2019-2020, India exported tomatoes export quantity 93,621.53tonnes, export value in Rs 22,259.85 Lakhs. And during the year 2019-2020, India exported tomatoes export quantity 93,621.53tonnes, export value in Rs 22,259.85 Lakhs. (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. 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 Government publications/ website.

Result And Discussion.

Keeping in the view of the objective of the study the necessary data collected from different sources were analysed and interpreted. The results obtained are export quantity of Tomato products, export value of tomato products in India was collected from2001-2002 to 2019-20 this includes 20 years of data. The period has been divided into two 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

Growth rate analysis, Instability analysis

1) Growth rate Analysis.

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

$Y=a.bt$ ..... (1)

Y = Dependent variable for which growth rate is to be estimated
(Export/Area/Production.
A = Intercept
B = Regression Coefficient
T = Time Variable

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

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

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

$CGR= [Antilog (\log b) – 1] \times 100$..... (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):

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

Δ = Standard deviation,
X= Arithmetic mean,
X = Variable, N = Number of observations

In the period Ⅱ the compound growth rate for tomato juice export quantity was 1.26 percent per annum and export value was -1.35 percent per annum. Tomato paste

presented and discussed below.

1.Compound growth rate in Area, Production, Export of Tomatoes, And Export of Tomato Products.

The exponential growth function used for estimation of compound growth rate of area, production and export of tomatoes. And export of tomato products. It was divided into three periods namely, period I (2001-2002 to2009-2010), period II (2010-2011 to 2019-2020) and overall period (2001-2002 to 2011-2020).

Table 1 The results revealed that compound growth rate for area, production and export quantity, export value. In period I Growth rate of area rate of 3.85 percent per annum and period II, -1.47 per cent per annum and found to be statistically at one percent level of significance in the first period. Growth rate of production in period Iwas 6.10 percent per annum. In period IIwas 1.68 percent per annum Growth rate in export quantity in period I was 0.08 percent per annum and period II of 7.73 percent per annum. Growth rate in export value in period I was negative growth rate -1.88 percent per annum and in period II negative growth rate -4.33percent per annum. overall period area of tomatoes had shown a positive significant growth rate of 3.66 percent, Production of 6.58 percent, Export quantity 8.60 percent, Export value 3.60 percent. It found that significant at one percent level of significance.

Table 2. The result revealed that, during the period I the compound growth rate for tomato juice export quantity -12.96percent per annum, export value was 3.99percent per annum. Tomato paste export quantity was 8.37 percent per annum, export value -6.68percent per annum. 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 107.52percent in period I and overall period with co-efficient of variation at 145.56percent. Export value of tomato export quantity and export value were 2.42 and 5.74 percent per annum. Tomato peeled export quantity was -19.81 percent and export value 13.61percent per annum. The overall period 20 years compound growth rate of tomato products, tomato juice export quantity and export value negative and nonsignificant were -1.28and-17.06percent respectively.Tomato paste export quantity was10.46 percent per annum, export value was-1.10 percent. Tomato peeled export quantity and export value were 4.34 and 1.06 percent respectively. Itfound that positive significant growth.

2.Degree of instability of Area, Production, Export of tomatoes and export of tomato products.

The coefficient of the variation function used for estimation of degree of instability in area, production, export of tomatoes, and export of tomato products.

Table 3.Results revealed that the area of tomato in exhibited less variability with coefficient of variation at 11.7 percent and 6.34 percent in period I and period II and it was highest in overall period with coefficient of variation at 23.53 percent. Production of tomato less variability with coefficient of variation at 18.53 percent and7.06 percent in period I and period II and it was highest in overall period with coefficient of variation at 36.56 percent. The export quantity of tomatoes exhibited highest variability with coefficient of variation at 97.60 percent in period I and less variation of 62.41 percent in period II and overall period with coefficient of variation at 82.97 percent. The export value of tomatoes exhibited highest variability with coefficient of variation at 88.55 percent and less variation of 57.63 percent in period II and overall period with coefficient of variation at 71.77 percent.

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

juice was highest variation in period Ⅱ that is 86.74percent, and less variation in period Ⅰ was 43.98percent and overall period with co-efficient of variation at 65.39 percent.

The export quantity of tomato paste showed highest variation of 82.47percent in overall period compared to period Ⅰ and period Ⅱ that is 38.45 percent and 54. 22percent respectively. Export value of tomato paste was highest variation of 59.21percent in period Ⅰ and less variation of 30.77percent in period Ⅱ and overall period with co-efficient of variation at 51. 82percent.

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

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 it has 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 Area and production. Processing of tomatoes and Export of tomato products in India is less than other countries so that improve the technology and more facilities for processing. Most of the tomato varieties grown in India used for table purposes, less varieties of tomatoes used for processing improve more tomato varieties for processing purpose.

Table 1. Compound Growth rates of Area, Production, Export of Tomato.

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.

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, 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
1	Tomato	Export	Mean	36.9	86.4	61.65

	juice	quantity	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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