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An economic analysis of export of tomato

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Abstract
To study the instability of area, production, quantity and value of export of tomato, tomato juice, tomato paste, tomato peeled and export competitiveness of tomato. The secondary data from 2000-2001 to 2019-2020 collected from Agricultural and Processed Food Products Export Development Authority, Food and Agricultural Organization, Indian Stat Agri. The time series data was divided into three periods *viz.,* period I (2000-2001 to 2009-2010), period II (2010-2011to 2019-2020) and overall period (2000-2001 to 2019-2020). Coefficient of variation was used to estimate the instability. During overall period, the higher coefficient of variation was observed in export quantity of tomato juice, tomato peeled, tomato paste and tomatoes with CV of 145.56, 91.35, 82.87 and 82.97 per cent 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.

Keywords: Instability, export, tomato

Introduction

Tomato (*Solanum lycopersicum*) is most important vegetable crop, in India and worldwide and it belongs to family solanaceae originated in South America. 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. A significant amount of tomatoes are grown in India, where they are consumed both fresh and processed. As a result of their perishable nature, tomatoes must be processed and cold-stored for later use. Tomatoes play a significant role in human diets and may be a strong source of axerophthol vitamin C and K, as well as being cholesterol-free, high in protein, and rich in minerals like iron, phosphorous, and potassium. Tomatoes also have a 95 percent water content, along with 5 percent carbohydrates and fibre, and are a good source of iron and other minerals. Because of its early and extensive climatic adaptation, tomatoes are a multipurpose crop that are referred to as both a protective food and a supplementary food. They are also known as "poor man's orange" because of their low cost. One of India's most significant and transient crops is the tomato. Tomatoes are a crop with a limited growing season, and India has a year-round tomato growing season as a result of rising market demand. In the years 2000–2001, 1.8% of tomatoes were exported from tomato production; this percentage climbed to 4.6% in 2020-2021, and it reached a high of 5.2% in the 2018-2019.

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 that export quantity 93,621.53tonnes, export value in Rs 22,259.85 Lakhs and tomato paste was export quantity was 350 tonnes and export value in Rs 13,212.90 lakhs and tomato peeled export quantity was 106 tonnes and export value in Rs 82250.51 lakhs. The export of tomatoes and its products has been increasing significantly. The tomatoes and its products also exported to Bangladesh, U Arab EMT, Nepal, Oman, Qatar, Maldives, Bhutan, Saudi Arab, U S A, Kuwait and other country. Export of tomatoes and its products from India showed that, India has enough to grow more tomato and to process the tomatoes and it is a major exporter as well as there exists vast potential to bring more area production export under tomatoes and tomato processed products to increase. So that Objectives of the study is to work out the instability in area, production and export of tomatoes and export of tomato products.

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Research Methodology
Nature and source of data
The present study was based on secondary data. The data collected from Agricultural and Processed Food Products Export Development Authority (APEDA), Food and Agricultural Organization (FAO), India stat Agri, Agricultural Produce Marketing Committee (APMC), various Government publications/ website. 2000-2001 to 2019-20. The 20 years data has been divided into three periods. Period I (2000-2001 to 2009- 2010), Period II (2010-2011 to 2019-2020), Overall period (2000 – 2001 to 2019 – 2020).

Analytical tools and techniques
Degree of instability
In order to study the instability in the export of tomatoes and its products Coefficient of Variation, (CV) was used, the formulae in given as

Coefficient of Variation (CV) = $\sigma/\bar{x}*100$
σ = Standard deviation
$\bar{x}$ = Arithmetic mean

Results and Discussion
Instability in area, production, export of tomatoes and it's products
The area of tomato was showing less variability was 11.7 and 6.34 per cent for period I and II. The high degree variability of area was 23.53% for overall period. The variability in production of tomato was 18.53 and 7.06 per cent for period I and II which was less variability during the period of study. However, the high degree of variability of production of tomato for overall period (36.56%). The quantity of export of tomato exhibited less variability and it was 62.41 and 82.97 per cent for period II and overall period. The high degree of variability of quantity of export of tomato for period I (97.60%). The value of export of tomato was showing less variability and it was 57.63 and 71.77 per cent for period II and overall period. The high degree of variability of value of export of tomato was 88.55 per cent for period I. The quantity of export of tomato (82.97%) had the highest degree of variability and instability than that of value of export (71.77%), production (36.56%) and area (23.53%) of tomato.

Table 1: 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

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

The quantity of export of tomato juice was low variability and it was noticed to be 107.52 and 137.26 per cent for period I and II. Which was high degree of variability for overall period (145.56%). The value of export of tomato juice exhibited less variability was found to be 43.98 and 65.39 per cent for period I and overall period and the high degree of variability

for period II (86.54%). The quantity of export of tomato paste exhibited less variability for period I (38.45%) and period II (54.22%) and it was high degree of variability for overall period (82.87%). The value of export of tomato paste was less variability and it was 30.77 and 51.82 per cent for period II and overall period however, it was high degree of variability for period I (59.21%). The quantity of export of tomato peeled exhibited less variability for period I (54.20%) and period II (77.22%) and it was high degree of variability for overall period (91.35%). The value of export of tomato peeled was showing less variability and it was 51.16 and 57.39 per cent for period I and II and high the degree of variability for overall period noticed to be (66.54%). The export quantity of tomato juice, tomato paste, tomato peeled was noticed to be (145.56%), (82.87%) and (91.35%) high degree of instability than that of value of export of tomato juice 6 (5.39%), tomato paste (51.82%), tomato peeled (57.39%).

Table 2: Degree of instability in export of tomato products

S. No	Particular	Parameters	Period I	Period II	Overall period
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.org), (Export Quantity in tonnes, export value in Rs lacs)

Conclusion and Suggestion
The study found an opportunity for improvement in the export of tomatoes and tomato-related products The high instability with coefficient of variation in tomato juice, paste, peeled and tomatoes than its area and production. Fewer kinds of tomatoes were utilised for processing in India, where the majority of tomato varieties were produced for table usage. Therefore, more tomato cultivars need to be improved for processing.

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