

## Trade Performance of Cumin in India During Post Globalization Period

Shilpa K Ramannagol\*, Dr. B. H. Nagoor\*\*

\*(Scholar of Department of Studies in Economics, Karnatak University Dharwad  
Email: ramanshilpa18@gmail.com)

\*\* (Professor of Department of Studies in Economics, Karnatak University Dharwad)

\*\*\*\*\*

### Abstract:

India is the world's largest producer, exporter and consumer of spices in the world and is rightly called as 'Spice bowl of the world'. During Economic Reforms in 1991, the standard of India's comparative advantages of the spice trade in the global market have changed significantly and they responded to the new world differently. Even India is world's largest cumin exporter, accounting for more than 75 percentage of global cumin trade. With reduction in trade restriction, India's Cumin trade exposed to international competition. It is important to assess India's cumin trade performance in globalised period. So, in this background the present study attempts to analyze the growth and instability in area, production, productivity and export during post globalisation period. Secondary data was used to analyse production and export of Indian cumin for the period from 1991-1992 to 2019-2020. For this study statistical tools namely, Growth rate from year-to-year analysis, revealed comparative advantage and instability analysis index is used. The findings showed that there is positive growth in terms of area, production and productivity of Cumin in national level and export quantity and value of cumin had shown a big future in the world market. Cumin owned the positive and increasing trend of comparative advantage in international market in export.

**Keywords —Cumin, Growth, Instability, Export, Revealed Comparative Advantage.**

\*\*\*\*\*

### I. INTRODUCTION

India is the world's leading producer, exporter and consumer in the world of spices and is rightly called the 'Spice bowl of the world'. It has a long and illustrious tradition of cultivating and exporting a wide range of high-quality spices. Scrupulous evidences regarding different spices, their properties, and uses can be found in Vedas dating back to 6000 BC. This has been possible due to the different climatic conditions that exist in each state, such as tropical, subtropical, and temperate. As per the Bureau of Indian Standards (BIS), out of the 109 spices identified by the ISO, about 75 are grown in our country, with only a dozen being commercially grown and traded. Spices are commonly used in Pharmaceuticals, Medicine, Beverages, Food processing and including

cosmetics. The major spices produced and exported in India are chillies, turmeric, black pepper, cardamom, ginger, coriander, cumin, and other seed spices. Almost every state in India produces spices. About 3.96 million hectares are under spices cultivation and produced 8.41 million tonnes in 2017-18, with Andhra Pradesh, Gujarat, Rajasthan, Karnataka, Telangana, Tamil Nadu, Assam and Uttar Pradesh being the top producers. The major spices producing countries are India, Guatemala Sri Lanka, Malaysia, Indonesia, Brazil, Pakistan, and Bangladesh. India occupies top position in world trade of spices. In the 2017-18 fiscal year, India exported 1.08 billion kg of spices worth \$3.11 billion and Spices are traditionally one of the major sources of export earnings.

Till 1991 the spice trade scenario was different.

There was huge restriction on spice trade, heavy amount of tariff imposed on spices, restrictive import licensing system and trade barriers etc., So, in this background India adopted New Economic Reforms in 1991, which carries abolishing trade barriers, reduction in tariff, relaxation in restrictive import licensing system and simplified etc., to develop the economy. During this period, the levels of comparative advantages of Indian spice trade in the world economy has shifted significantly and they responded to the new world differently. India is the largest exporter of cumin to the world and where its exchange accounts for more than 75% of global trade. The present study attempts to analysis the instability and growth rate of cumin in terms of area, production, productivity and export during post globalisation period.

### **Framework – about Cumin**

Cumin (*Cuminum cyminum*) (also known as Jeera/Zeera) is a small herb, which produces aromatic dried fruit. It is assumed that the origin of cumin is either Egypt or the south Mediterranean region (Kafi, 2006). The plant belongs to Apiaceae family. Cumin is cultivated mostly in tropical and subtropical regions (ideally within the 20 degree to 38-degree north latitudes) and it requires low atmospheric humidity (Kafi, 2006). India is the world's largest cumin producing country, contributing around 75% of total world output. The other major cumin-producing countries are Syria (13%), Turkey (5%), UAE (3%), and Iran. India's cumin production area is projected to be 842 thousand hectares. and produced 547 in thousand MT in the year 2019-2020. In 2019-20 as per estimation, India exported 2,10,000 tonnes of cumin in terms of quantity and 3,22,500.00 in terms of value. India exports cumin to 150 countries with its three major markets being Vietnam, Bangladesh and USA.

## **II. THEORETICAL FRAMEWORK**

Ricardo (1917) uses the example of wine and cloth exchange between Portugal and England to demonstrate the advantage of specialization and trade. His writings laid the groundwork for the theory of comparative advantage, which states that if people and capital work together, overall production rise. Nations participate in parties in which they have the greatest advantage over others in which they have the most resources.

There is an absolute comparative advantage in the case of spices in a country like India. Because of its margin of dominance in production and low opportunity cost of production, this measure would give the spice trade an advantage.

## **III. REVIEW OF LITERATURE**

**Chaitra and Sonnad (2019)** examined that instability and growth in area, production, productivity, export volume and value of cumin and chilli in India. They glance at the composition and direction of cumin and chilli in the time frame for analysis. The period of study is 19 years that too 1999 to 2017 and through this study they found that there was positive growth in area, production and productivity of cumin in the study period but it's not in the case of chilli, area of cultivation found negative growth in chilli. The volume and value of Indian chilli and cumin exports had increased. Chilli and cumin exports were both productive.

**Thomas and Sanil (2019)** studied the trade competitiveness in spice trade of India, trade barriers, policy issues and trade agreements related to spice trade. They found that the domestic market consumes around 90 percent of the total production of spices in the country. In case of trade agreements there is no significant change in the trade efficiency of spices and India is having comparative and competitive advantage in selective spices.

**Sunil and Nair (2018)** examined the production, export and trade competitiveness of pepper. They also found that rivalry has risen in the pepper commodity particularly in the international market, domestic market is the largest market for pepper, liberalization has a huge influence on trade performance of pepper and the Pepper export has decreased in the liberalisation period.

**Felice Joy (2018)** analysed that the trade performance of spice sector in terms of area, production and productivity in Kerala in the post liberalisation period. Along with that he studied the export performance of spices in the post liberalisation period and the socio-economic aspects of the spice's cultivators. Through this study he found that the growth of area and production in Kerala was quiet positive in the pre liberalisation period but it has changed as negative growth in area of production in the post liberalisation period and he also found that there was high implication of regional trade agreements on Kerala economy particularly in case of pepper and cardamom.

**Hari babu (2017)** analysed that the trade performance of Indian spices particularly to check out the increase and decrease trends of trade spices in study period. Through this study he found that the export has deceased and production has increased and the trend of trade was restricted to study period.

**Bhatt and Valasan (2016)** Studied that the Export Trends of Indian major spices like Pepper, Turmeric, Ginger, Coriander, Cumin, Curry Powder & Seed spices from Kerala that too in the national level and world level in the present scenario. They found that USA & UAE are the top focused exporting location for Indian major spices. They also came to know that the constant growth rate in exports of Chillies, whereas Pepper, remaining have good opportunity of future growth.

**Rajalakshmi (2010)** examined growth performance of spices in terms area of production

and export of spices in Tamilnadu state as well as in India. He also studied the influence of liberalization on trade of spices and he analysed the problems faced by the producers and traders of spices in the study area. She found that Kerala and Madhya Pradesh secured the first position in the area and production respectively in 1999, India increased import of pepper after liberalisation compare to before liberalisation and export of spices commodity increased after liberalisation.

#### **IV OBJECTIVES OF THE STUDY:**

The present study attempts to analysis the growth and instability in terms of area, production, productivity and export of cumin during post globalisation period.

#### **V. METHODOLOGY:**

The research is focused on secondary information. To achieve the objectives of the study, time series data were collected on production, productivity, area of production and export of cumin in India from the FAO, Uncomtrade, Spice board of India and website [www.indiastats.com](http://www.indiastats.com) from 1991-92 to 2019-20.

In order to analyses instability in production, area of production, productivity and export of cumin coefficient of variation index used by the help of standard and mean deviation. To analyze the growth in area, production and export of cumin, Year over year tool is used (annual wise growth rate). To examines the India's cumin comparative advantage, the study used Revealed Comparative Advantage (RCA) Economic Frame work and advanced model of RCA., Revealed symmetric comparative advantage also used.

#### **Year over year growth rate:**

The growth in quantity of Production, area and export of cumin in terms of quantity was analyzed using Year to year growth rate. YOY computed by using below formula.

$$Y = \frac{Y_t - Y_{t-1}}{Y_{t-1}} \times 100$$

Here,

Y = Year

$Y_t$  = Current year of production, export and area of production of cumin

$Y_{t-1}$  = Previous year of production, export and area of production of cumin

### Instability analysis

In order to study the fluctuation in the cumin production, area of production and productivity and exports, coefficient of variation is used as a measure of instability.

$$CV = \frac{SD}{AM} \times 100$$

Whereas,

C.V. = coefficient of variation,

SD = standard deviation,

AM = arithmetic mean

### Revealed Comparative Advantage (RCA) Analysis

The performance of Cumin is done by the RCA analysis. Revealed Comparative Advantage (RCA) was first introduced by Bela Balassa (1965). The objective of using RCA is to analyze a competitive advantage of Indian cumin in world market. RCA measures export performance of country or commodity. Its formula defined as a country's share of world exports of a commodity divided by its share of total world exports.

The index for country i and commodity j is calculated as follows:

$$RCA_{ij} = \frac{(X_{ij}/X_{ik})}{(X_{nj}/X_{nk})}$$

Here,

$X_{ij}$  = Exports of country 'I' of commodity 'j'

$X_{ik}$  = Exports of country 'I' of a total agricultural commodity 'k'

$X_{nj}$  = Exports of a world 'n' of commodity 'j', and

$X_{nk}$  = Exports of a world 'n' of a total agricultural commodity 'k'

The following technique, the index is formed symmetric, following the methodology suggested by Dalum et al (1998) and the resultant index is called as 'Revealed Symmetric Comparative Advantage' (RSCA). It can be expressed mathematically by the following equation.

$$RSCA = (RCA-1) / (RCA+1)$$

This measure ranges between -1 and +1. If the corresponding RSCA value is positive, a product is said to have competitive advantage in its export, and vice versa. The RSCA was used to investigate the comparative advantage in this analysis.

## VI. ANALYSIS AND DISCUSSION

Present study analysis area, production, productivity and export trends of Indian cumin during post globalization period. The study examines the growth rate trends of cumin in terms of export and production by applying Year on year growth rate, instability in area of production, production, productivity and export of cumin analyzed by using CV (coefficient of variation) with the help of SD (standard deviation) and mean. The study also analysis the revealed comparative advantage of Indian cumin in the world market by using RSCA economic framework. Here the below study shows that there is more instability in the first and second decade and more stable growth in third decade. Present study also observes that there is positive and significant growth rate in area of production, production, productivity and export of Indian

cumin during post globalization period and in terms of revealed comparative advantage, India is enjoying comparative advantage in cumin exports.

**Table 1: Year on Year Growth Rate of Area and Production of Cumin in India**

Year	Area	Production
	(Percentage of growth rate)	(Percentage of growth rate)
1991	-	-
1992	91.87	108.32
1993	34.06	23.15
1994	-32.98	-28.59
1995	-21.88	-36.67
1996	39.36	55.51
1997	-5.93	-1.54
1998	-8.52	-6.42
2002	97.31	NA
2003	0	NA
2004	0	-
2005	-22.69	13.52
2006	1.49	-11.71
2008	28.88	60.34
2009	-1.9	7.39
2010	20.89	55.64
2011	34.92	-2.2
2012	-29.57	-14.76
2013	44.6	30.33
2014	3.6	-5.53
2015	-9.19	3.6
2016	-3.34	-1.99
2017	23.69	39.76
2018	6.31	1.45

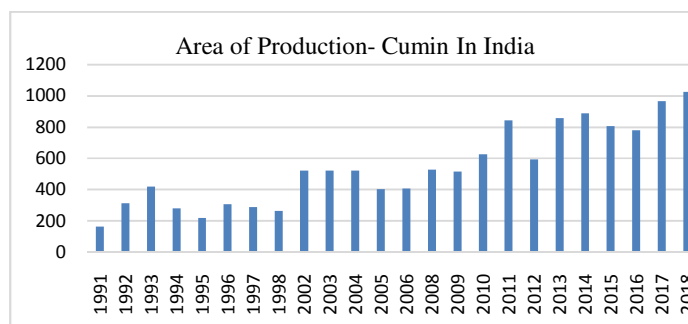
Source: Indiastat.com

Note: 1998 to 2002 data is not available, NA=Not Available

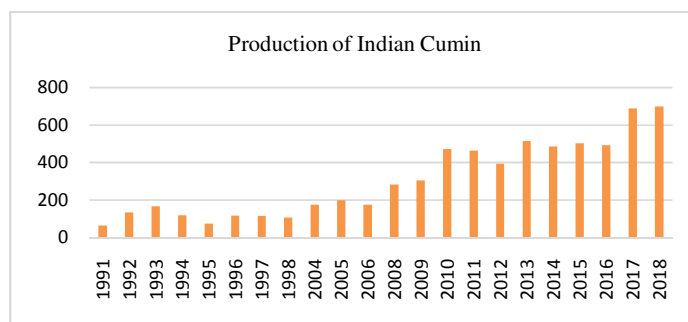
Table 1 explains that the growth rate of cumin in area and production from 1991 to 2018. The year-by-year growth rate of area and production is completely constant in the year 2003 and 2004. Growth rate in area and production of cumin increasing year by year but above table clears that

the growth rate is not positive all the time and the study reveals that the year wise growth rate in area of production and production of cumin is not stable over the period.

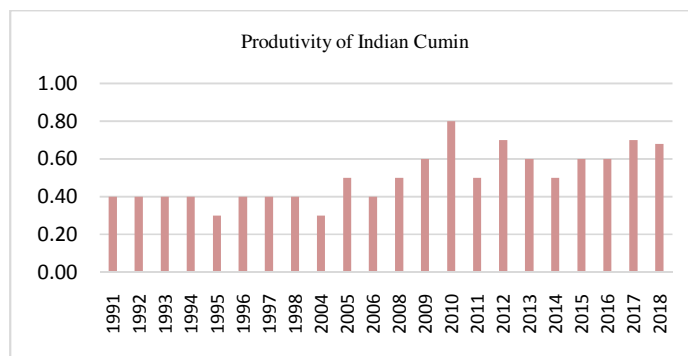
**Graph 1: Area of Production of Indian cumin from 1991 to 2018 (Area in 000 Hectare)**



**Graph 2: Production of Indian Cumin from 1991 to 2018 (Production in 000 MT)**



**Graph 3: Productivity of Indian Cumin from 1991 to 2018 (Productivity in MT/Hectare)**



Above the graph 1 shows that trends in area of production of cumin in India. Over a period of time, graph shows that there is positive growth in area of production and there is increasing and positive trends in area of production of Indian cumin. Here the study observes that there is a continuous increasing growth rate trends in cumin's area of production since 2010. The above graph 2 illustrate that production of cumin started increasing significantly since 2010. So, in the initial stage of economic reforms 1991 there was low growth rate in cumin's production but in the 21<sup>st</sup> century there was impressive and positive growth rate in cumin's production. And the graph 3 indicates that there is positive and increasing growth rate trends in Indian cumin's productivity. In the year 2010, it has reached its peak in terms of productivity.

**Table 2: Year on Year Growth Rate - Export of Cumin**

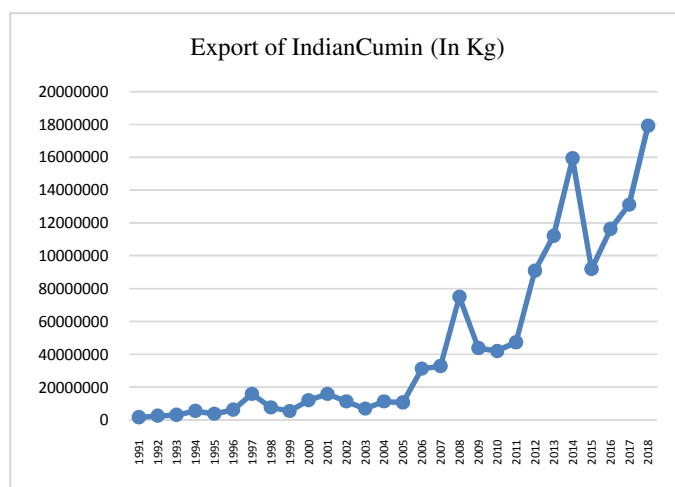
Year	Export in Qty	Export in value
	(Percentage of growth rate)	(Percentage of growth rate)
1991	-	-
1992	59.7	117.35
1993	21.35	-8.54
1994	75.34	52.57
1995	-30.91	-34.05
1996	65.6	89.25
1997	153.49	123
1998	-52.19	-51.86
1999	-28.69	-26.05
2000	121.84	187.33
2001	32.07	42.31
2002	-28.84	-41.67
2003	-38.9	-44.34
2004	63.26	67.11
2005	-5.06	-0.19
2006	192.81	193.88
2007	5.1	53.25
2008	128.75	130.06
2009	-41.68	-45.75
2010	-4.01	-2.63
2011	12.66	50.48
2012	92.11	62.38
2013	23.36	11.57
2014	42.13	16.04

2015	-42.31	-23.55
2016	26.51	24.66
2017	12.7	22.28
2018	36.71	23.73

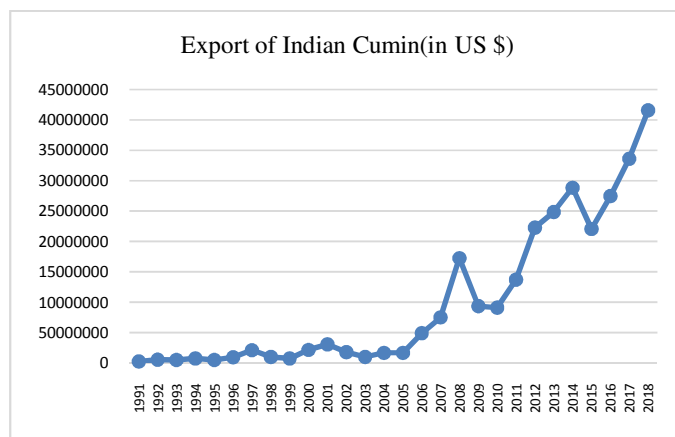
Source: Uncomtrade

Table 2 explains that Growth rate of Cumin's export year by year in terms of percentage. So, the above table shows that the percentage of growth rate in cumin export is positive in most of the years. Considering the above information, compared to all the years, the year of 2006 has the highest growth rate in export. And the growth rate of cumin export is more stable and positive in the last few years.

**Graph 4: Export of Indian Cumin (Quantity)**



**Graph 5: Export of Indian Cumin (Value)**



Above the graph 4 illustrate that there was slow expansion of cumin export in the initial period of economic reforms 1991. The graph shows that there is increasing and positive growth trends in term of cumin's export quantity after 2007. The graph 5, says that export of cumin is increasing in terms of export value. As per above graph, study observes that cumin export in terms of value shows very significant and positive growth rate in the last ten year.

**Table 3-Instability in Area, Production and Productivity of Indian Cumin**

Period	Area	Production	Productivity	Export
1991- 2001	26.2	28.42	9.12	70.13
2001-2011	24.08	39.79	29.73	76.49
2011- 2020	15.38	19.27	10.8	35.75

Source: Indiatat.com

Note:2011-2020 is nine years data (since the data is available till 2019-20)

The above table 3 analysis the instability index in terms of area of production, production, productivity and export of cumin, here the table observes that there was more instability in first decade of area of Production compare to other two remaining decades. In terms of production and productivity of cumin,second decade shows more instability and while studying the instability in export almost first and second decade shows more instability but third decade is relatively stable in cumin export. In the last decade, as seen in the table above, there is low instability in the Area, Production, Productivity and Export of cumin with coefficient of variation of 15.38, 19.27, 10.80 and 35.75 percent respectively.

Table 4, shows that the Revealed symmetric comparative advantage of Indian Cumin. Through this table the study observes that the export of Indian cumin had responded differently in terms of comparative advantage during the study period.

India had enjoyed a comparative advantage in cumin exports. India had strengthened its position in the global markets in exports of cumin. India's status in exports of cumin is very impressive.

**Table 4: Revealed Symmetric Comparative Advantage of Indian Cumin**

Year	Cumin
1991	0.91
1992	0.94
1993	0.88
1994	0.94
1995	0.88
1996	0.91
1997	0.94
1998	0.86
1999	0.89
2000	0.93
2001	0.79
2002	0.52
2003	0.54
2004	0.8
2005	0.85
2006	0.86
2007	0.85
2008	0.95
2009	0.92
2010	0.92
2011	0.92
2012	0.92
2013	0.91
2014	0.93
2015	0.94
2016	0.95
2017	0.94
2018	0.90

Source: Calculated from Uncomtrade

**Table 5: India's cumin Export share in total India's Spice export share 2015 to 2020**

Year	Percentage share (Qty in tonnes)	Percentage share (Value in Lakhs)
2015-16	11.6	9.43
2016-17	12.56	11.02

2017-18	13.97	13.45	2017	69.6	65.55
2018-19	16.39	14.79	2018	41.23	39.89
2019-20	17.75	14.99			

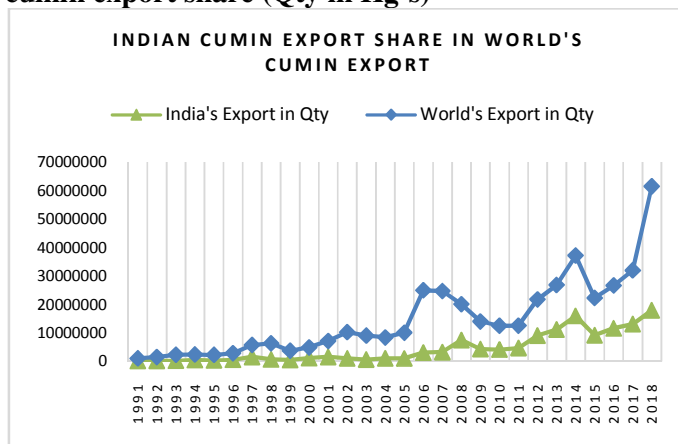
Source:Spice board of India

Table 5 illustrate that percentage share of cumin export in total of spice export from India. The share of cumin export is increasing year by year and its growth is quite impressive in share of cumin export. As per above table, the study observes that export share of cumin is increasing every year and cumin share is almost its 65 percentage in export quantity and 62 percentage in export value within five years of analysis.

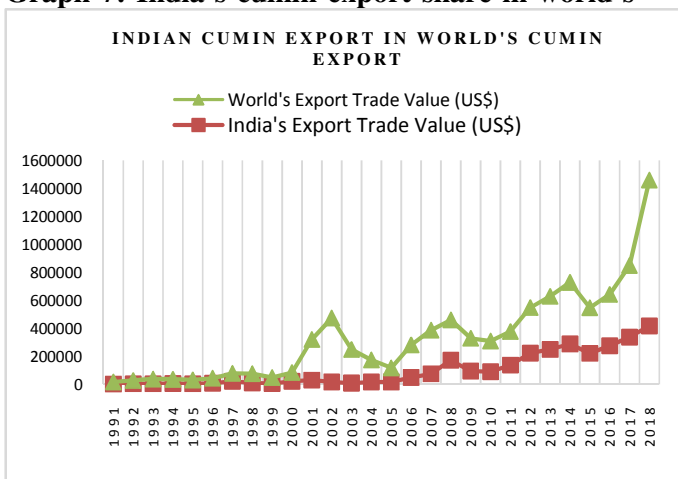
**Table 6: Percentage of India’s cumin export share in world’s cumin export share**

Year	Quantity in Percentage	Trade Value in Percentage
1991	17	18.06
1992	19.49	25.72
1993	15.17	15.58
1994	28.55	27.5
1995	19.45	19.53
1996	26.93	28.19
1997	37.8	37.02
1998	13.56	15.52
1999	16.66	18.54
2000	31.81	35.02
2001	28.1	10.62
2002	12.29	3.94
2003	8.21	4.19
2004	15.35	10.62
2005	11.8	16.52
2006	14.29	21.19
2007	15.33	24.09
2008	59.71	60.15
2009	45.35	39.89
2010	50.4	41.97
2011	60.2	57.34
2012	71.76	68.47
2013	71.88	65.47
2014	75.09	65.62
2015	70.37	67.54
2016	77.51	74.96

**Graph 6: India’s cumin export share in world’s cumin export share (Qty in Kg’s)**



**Graph 7: India’s cumin export share in world’s**



**cumin export share (Value in US\$)**

Table 6, graph 6 and graph 7 indicates that India’s export share increasing continuously in the world market. As per the sources of the study, India is the largest exporter of cumin in the world. The two states namely, Gujarat and Rajasthan are the major producing states in the country. Since 2005, share of Indian cumin export started increasing significantly in the world market, in an average



India exports 75% of cumin to world economy. And in the year 2018 the export of cumin raised significantly compared to its previous years.

## VII. CONCLUSION

Cumin production and export have increased globally over the last decades. Growth rate in area and production of cumin increasing year by year, there is positive and increasing growth rate trends in Indian cumin's productivity, India had enjoyed a comparative advantage in cumin exports, the share of cumin export is increasing year by year and its growth is quite impressive in share of cumin export and Gujarat and Rajasthan are the major producing states in the country.

Demand for Cumin is expected to continue to rise as the world's population rises, changing food consumption behavior, and increasing demand for value-added products such as oil and powder. Cumin export increased significantly in both Export quantity and value. Cumin enjoyed the positive and increasing trend of comparative advantage in international market in exports. The exports had increased significantly in the past few years due to strong demand from the overseas markets. India is one of the major producers, exporter and consumer of cumin in the world.

## VIII. POLICY IMPLICATION

To conclude, during the Globalization regime, the growth and trends of Indian cumin export have changed significantly. The share of traditional export items has declined and the share of value-added spices and new items of exports have increased. The demand for Indian cumin products is ever increasing both in the internal and domestic markets. The instability in terms of area, production, productivity and export of cumin was very high in the first two decades of the study. The instability of cumin is mainly due to increased

value of cumin in the global markets.

While spices are extremely important, it is unfortunate that the sector has not developed to its full potential due to numerous issues in export, supply chain and marketing etc. The production of cumin fluctuates widely and the its prices also much volatile. Therefore, to protect the interest of farmers minimum support prices may be announced. To protect cumin growers from price fluctuation, the productivity and zone of cumin should be stabilized through a crop insurance scheme for spices. Improved production technologies and improved varieties are needed to provide for increase in productivity of Indian cumin.

## REFERENCES:

- Abraham, A. (2018) "The Trend in Export, Import and Production performance of Black pepper in India" *International Journal of Pure and Applied Mathematics Volume 118 No. 18 2018, 4795-4802.*
- ANGLES, S. (2012). *An Economic Analysis of Trade Performance of Major Spices in Tamil Nadu And India.* (Ph.D. Thesis submitted to Tamil Nadu Agricultural University, Coimbatore) Retrieved from <http://researchgate.net/publication>
- Angles, S., A. Sundar and M. Chinnadurai (2011) "Impact of Globalization on Production and Export of Turmeric in India – An Economic Analysis" *Agricultural Economics Research Review Vol. 24 July-December 2011 pp 301-308.*
- Aparna, V. (2018). *A Study on the Impact of Trade Agreements on the Performance of Plantation Industry in India.* (Ph.D. Thesis submitted to Mahatma Gandhi University, Kottayam.) Retrieved from [shodhaganga.inflibnet.ac.in](http://shodhaganga.inflibnet.ac.in)
- Bhatt, A., &Valasan, J. (2016). "Spices Export from Kerala Current Trends & Opportunities Ahead". *IRA-International Journal of Management & Social Sciences (ISSN 2455-2267), 5(1), 54-65.*
- Bhavani, T. and Kamalavalli, A. L. (2018) "Export Performance of Indian Spice Products", *International Journal of Applied and Advanced Scientific Research, Volume 3, Issue 1, 2018.*
- Chaitra, G.B. and Sonnad, J.S. (2019). "Export performance of chilli and cumin from India: An empirical analysis". *Journal of Pharmacognosy and Phytochemistry 2019; 8(2): 2014-2020*
- Felice Joy (2018) *Performance of Spices Sector in Kerala: A Study with Special Reference to Post Liberalisation Era.*

- (Ph.D. Thesis submitted to Mahatma Gandhi University, Kottayam). Retrieved from [shodhaganga.inflibnet.ac.in](http://shodhaganga.inflibnet.ac.in)
- Ganga Devi, and Jadav, K.S. (2018) "Growth Performance in Area, Production, Productivity and Export of Spices in India" *ACTA SCIENTIFIC AGRICULTURE (ISSN: 2581-365X) Volume 2 Issue 11 November 2018*.
- Hari Babu, P. (2017) "Export Performance of Spices In India: An Empirical Study" *Parikalpana - KIIT Journal of Management*.
- Ibrahim, Y.C. (2015). *Export performance of Indian spices in the WTO regime: a disaggregated analysis*. (Ph.D. Thesis submitted to Cochin University of Science and Technology.) Retrieved from <http://dyuthi.cusat.ac.in>
- Ibrahim, Y.C. (2017). "Impact of WTO And Related Policies on Composition and Direction of Indian Spice Export" *International Journal of Research in Economics and Social Sciences, Vol. 7 Issue 11, November- 2017, pp. 20-29*.
- Kallummal, M. and Ratna, R.S. (2012) "ASEAN India Free Trade Agreement (FTA) and its Impact on India: A Case Study of Fisheries and Selected Agricultural Products", *Sage Journals Volume: 48 issue: 4, page(s): 481-497*.
- Krishnan, S. (2012) *Impact of WTO on Spices Sector in India – An Econometric Analysis*. (Ph.D. Thesis submitted to Mahatma Gandhi University, Kottayam.) Retrieved from [shodhaganga.inflibnet.ac.in](http://shodhaganga.inflibnet.ac.in)
- Krishnadas, M. (2010) "Production and Export Performance of Major Indian Spices - An Economic Analysis", (Ph.D. thesis submitted to Kerala agricultural university) Retrieved from <http://researchgate.net/publication>
- Meena, M.D., G. Lal., S.S. Meena, and N. K. Meena (2018) "Production and export performances of major seed spices in India during pre and post-WTO period", *International J. Seed Spices 8(1), January 2018:21-30*.
- Nagoor, B. H (2008) "World Trade Organization and India's Agricultural Exports: Performance and Prospects". *Thesis submitted to the University of Pune*.
- Nagoor, B. H (2009) "Performance of India's Tea Export: A Comparative study of major Rea Exporting Countries of the world". *IGIDR Proceedings/Project Report Series PP-062-21*.
- Nagoor B H (2021) "Market integration and changing direction of Trade: Case of India's Trade in Trade". *Centre for Development Studies*.
- Nitesh Kumar Banjare (2016) *An Economic Analysis of Production and Marketing of Major Spices in Raigarh District of Chhattisgarh*. (Ph.D. Thesis submitted to Indira Gandhi Krishi Vishwavidyalaya, Raipur.) Retrieved from [semanticscholar.org/paper](http://semanticscholar.org/paper).
- Rajalakshmi, A. (2010) *Trade Liberalisation and Its Impact on Marketing of Selected Spices in Tamil Nadu*. (Ph.D. Thesis submitted to Gandhi gram Rural Institute - Deemed University Tamil Nadu.) Retrieved from [shodhaganga.inflibnet.ac.in](http://shodhaganga.inflibnet.ac.in)
- Raziya, M. (2018) "Impact of WTO On Spices; With Special Reference to Pepper and Cardamom", *International Journal of Research in Social Sciences Vol. 8 Issue 4, April 2018*.
- Sabu, S.S., A. Kuruvila, and K. Manojkumar (2019) "Price behaviour of black pepper in Indian and International markets: a comparative analysis" *Journal of Spices and Aromatic Crops Vol. 28 (1) 27-33 (2019)*.
- SAKAMMA, S. (2009) *Export Trade of Major Spices of India: An Economic Analysis*. (Ph.D. Thesis submitted to Department of Agricultural Economics University of Agricultural Sciences, Bangalore.) Retrieved from [semanticscholar.org/paper](http://semanticscholar.org/paper).
- Srinivasa Rao, D. (2009) *An Econometric Analysis of Spices Exports from India*. (Dissertation Submitted to The Acharya Nagarjuna University, Nagarjuna Nagar.)
- Sunil, A. and Nair, K. (2018), "Marketing Opportunities and Export Competitiveness of Indian Spices: An Econometric Analysis". *European Journal of Business and Management. Vol.10, No.36, 2018*.
- Soumya, C., S.S. Burark., L. Sharma and H.K. Jain "Growth and instability in production and export of selected spices of India" *International J. Seed Spices 4(2), July 2014:1-1*.
- Thomas, L. and Sanil, P.C. (2019) "Competitiveness in spice export trade from India: A review". *Journal of Spices and Aromatic Crops Vol. 28 (1): 01-19*
- Vinod Naik, R., And Hosamani, S.B (2014) "Growth and export dimensions of Indian turmeric" *International Research Journal of Agricultural Economics and Statistics Volume 4, Issue 1, March, 2013, 91-97*.
- Yogesh, M. S. & Mokshapathy, S. (2014) "Growth of Indian Export And Import of Spices". *International Journal of Humanities, Arts, Medicine and Sciences, ISSN 2348-0521 Vol. 2, Issue 9, Sep 2014*.