



## THE EXPORT PERFORMANCE OF SELECTED VEGETABLES AND SPICES IN INDIA

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### Abstract

The present study has been conducted to examine the export performance of selected vegetables and spices in India. The accumulated data on important variables were compiled for the different periods from various published sources for the period from 1988-89 to 2012-13. Among the Vegetables Brinjal, Tomato and Onion and from the Spices Black Pepper, Coriander, Cumin and Chili were selected for the present investigation. And it is revealed that agricultural export was 21.82 per cent during the year 1990-91, which was formed to decrease to 9.9 per cent during the year 2010-11. It was revealed as a sign of India's development in Industrial area and processed products exports. During the pre-World Trade Organization (WTO) period, positive and significant growth rates was observed in onion (21.63 per cent) and during the post-WTO period, in Brinjal (272.37 per cent), tomato (58.22 per cent) and onion (17.27 per cent) the growth rate was formed to be positive and significant. The domestic wholesale prices of Brinjal, Tomato, Coriander, Cumin, Chilli and Onion were observed as less than the international prices. Thus it is concluded that exporting Coriander to other countries provides more benefit.

**Keywords:** WTO, Growth, Export, Import.

### Introduction

India has a unique opportunity to increase its export potentials of agricultural products, particularly during the free trade regime under WTO and provisions under 'Agreement on Agriculture' (AOA). There is a need to study the exports and factors which are responsible for enhancing the exports of the country. As per AOA provisions, developing countries are allowed to give export subsidy up to 24 per cent and reduce it up to 14 per cent within 10 years period of time but India has not provide with the provisions of any export subsidy. In view of global economic scenario onion in India has ample potential for exports in both fresh and processed forms (Yeledhalli and Kulkarni, 2009). The export performance of onion from India during the period from 1970-71 to 1999-2001 reflects the growth in volume of export, export earnings and unit value realization indicated a positive trend and the average NPC value of onion during 1996-97 to 1999-2001 reflects a moderate and high competitiveness respectively (Hymaet *al.* 2003). The agricultural exports from India during the period 1970 to 1989 observed that the compound growth rates of export earnings from all agricultural products comprising food and animal products, beverages and tobacco, vegetable oils, etc. was estimated at 6.67 per cent per annum (Pal, 1992). The Nominal Protection Coefficient (NPC), Effective Protection Coefficient (EPC) and Domestic Resource Costs (DRC) were less than unity for vegetables, which implies that the Indian horticultural sector has a comparative advantage (Siddaya and Atteri, 2011). Export of Chilies had shown a higher growth rate during post- liberalization period in terms of both quantity and value and the estimated instability index for chilies had revealed the trade was to be highly unstable during the pre-liberalization period, but had become moderately stable during post- liberalization period (Arulanandhuet *al.* 2007). The whole pepper and capsicum that increase in exports to neighboring regions is explained more by the increased demand and supply and not by the stringent quality requirements of traditional importing countries (Kumar and Muraleedharan, 2007). The instability indices for export of onion in terms of quantity, U.A.E., Bahrain and Saudi Arabia were stable importers and for green chilli Bahrain was observed to be stable importer. It was observed that India was in a competitive position for export in case of onion and green chilli with the NPCs values of 0.97 and 0.89 respectively during the year 2009-10 (Patilet *al.* 2012). Under this backdrop, the paper attempts to analyse the performance of export in India. With the objectives of the study as:

- i. To study the export performance of selected vegetables and spices in India.
- ii. To study the competitiveness of selected vegetables and spices in India.

### Materials and Methods

The study based on the secondary data collected for the period of 1988-89 to 2012-13. The data on different aspects required for the present study were collected from APEDA, Directorate General of Commercial Intelligence and Statistics (DGCIS), Government of India, Food and Agricultural Organization (FAO) and [www.indiastat.com](http://www.indiastat.com) [www.agricoop.com](http://www.agricoop.com) website. The collected data were analyzed by dividing them into two phases. First phase was before WTO i.e. 1988-89 to 1994-95. The second phase was after WTO i.e. 1995-96 to 2012-13 and an overall analysis was also conducted for the entire period under study i.e. 1988-89 to 2012-13. Among the different Vegetables, Brinjal, Tomato and Onion and from the Spices, Black Pepper, Coriander, Cumin and Chili were selected for the study.



The performance of different crops was examined by estimating compound growth rates of export and import for different periods. The growth rate was estimated using exponential trend model.

To compute the export and import of selected vegetable and spices with the following form of regression equation was used.  
$$Y^t = ab^t$$

Where, 'Y' is export and import quantity etc. in year 't', 'A' is intercept indicating Y in the base period ( $t_0$ ), 'b' is regression coefficient and 't' is time variable. From the estimated function the compound growth rate was worked out by  $CGR(r) = [Anti \log (b - 1)] \times 100$ ,  $CGR(r) =$  Compound growth rate. The Degree of instability in export and import of selected vegetable and spices for different period was measured using coefficient of variation and coefficient of instability.

Coefficient of Variation (CV) =  $(\sigma / X) \times 100$ . Where, 'σ' is standard deviation and 'X' is arithmetic means. Nominal Protection Coefficient was computed to determine the extent of competitive advantage enjoyed by the commodity in the context of free trade. The coefficient shed light on whether a country has comparative advantage in the export of that commodity in the free trade scenario or not. NPC is defined as the ratio of the domestic price to the world reference price of the commodity under consideration. Symbolically,

$$NPC = Pd / Pb$$

Where, 'Pd' - Domestic Whole sale price of the commodity, 'Pb' - World reference price of the commodity. If  $NPC > 1$ , the commodity is protected, compared to the situation that would prevail under free trade and if  $NPC < 1$ , the commodity is dis-protected.

## Results and Discussion

### Growth rates of vegetables of export quantity

The Table 1, reveals that, during the pre-WTO period, positive and significant growth rates were for, tomato (67.93 per cent) and onion (12.54 per cent) and Brinjal was not at all exported in this period. During the post-WTO period, a positive and significant growth rate was observed in Brinjal (59.05 per cent), tomato (50.42 per cent) and onion (11.88 per cent). And the study on overall period, there was a positive and significant growth rate in all, with Brinjal (41.38 per cent), tomato (43.75 per cent) and onion (8.30 per cent) respectively.

### Growth rates of vegetables of export value

From the Table 1 in view of the Export value of selected vegetables during the pre-WTO period, a positive and significant growth rates were observed in onion (21.63 per cent). But in tomato (45.21 per cent), the growth rate was found to be positive but non-significant whereas Brinjal was not exported during period. But the post-WTO period, the vegetables under studies i.e. Brinjal (272.37 per cent), tomato (58.22 per cent) and onion (17.27 per cent), the growth rates were observed to be positive and significant. And an overall period of export value, a positive and significant growth rates were observed in Brinjal (161.69 per cent), tomato (49.26 per cent) and onion (15.36 per cent). Though over the years agricultural export has increased by many folds but the share of agriculture on total export has decreased from 21.82 per cent during 1990-91 to 9.9 per cent in 2010-11

### Growth rates of spices of export quantity

From the Table 1 it was observed that, during the pre-WTO period, a positive and significant growth rates were observed in cumin (50.12 per cent). And in case of black pepper (14.52 per cent) and coriander (29.06 per cent) the growth rates were positive but non-significant. But in case of Chilli (4.46 per cent) a negative and non-significant growth rate was observed. During the post-WTO period, a positive and significant growth rate was observed in coriander (7.38 per cent), cumin (13.43 per cent) and Chilli (11.71 per cent). But black pepper (-1.16 per cent) shows a negative and non-significant growth rate. For an overall period, there was a positive and significant growth rate as observed in coriander (8.14 per cent), cumin (16.99 per cent) and Chilli (12.88 per cent) but black pepper (-0.90 per cent) shows negative and non-significant growth rate.

### Growth rates of spices of export value

From the Table 1 in terms of the Export value of selected vegetables, during the pre WTO period, a positive and significant growth rates were observed in cumin (66.63 per cent). In black pepper (31.77 per cent), coriander (41.02 per cent) and Chilli (13.23 per cent) the growth rates were negative and non-significant. During the post-WTO period, positive and significant growth rate was observed in coriander (13.62 per cent), cumin (19.84 per cent) and Chilli (16.25 per cent) but black pepper (-0.72 per cent) shows negative and non-significant growth rate. The overall period, under study reveals a positive and



significant growth rate in black pepper (5.08 per cent), coriander (15.58 per cent), cumin (23.76 per cent) and Chilli (18.60 per cent).

#### **Coefficient of Variation export quantity of selected vegetables and spices**

The performance of exports, during the period under study was measured not only from the point of view to increase or decrease in export but also to the extent of fluctuation in the export. In order to examine extent of instability, coefficient of variation on instability index in export of different commodities were worked out and presented in Table 2.

#### **Coefficient of Variation of Export Quantity in vegetables**

Table 2 reflects the Coefficient of Variation of selected vegetables during the pre-WTO period, post-WTO period and for overall period under study. The highest C.V. was observed in Tomato with 114.07, 125.65 and 177.34 per cent respectively. Whereas lowest C.V. was observed in onion with 18.93, 61.27 and 66.54 per cent respectively. It indicates least consistency in exporting quantity of Tomato while, onion showed the consistency in quantity exported during this period.

#### **Coefficient of Variation of Export Quantity in Spices**

Table 2 further reveals the Coefficient of Variation of selected spices during the pre-WTO period, post-WTO period and for overall period under study. The highest C.V. was observed in Cumin with 62.73, 75.05 and 94.28 per cent respectively. While the lowest C.V. was observed in Black Pepper i.e. 35.27 per cent for the overall period under study. It indicates least consistency in exporting the quantity of Cumin while, but Black Pepper showed the consistency in quantity exported during this period.

#### **Coefficient of Variation of Export Value in vegetables**

Table 2 also revealed that, during the pre-WTO period, post WTO period and overall period under study the highest C.V. was observed in Tomato with 111.80, 151.92 and 181.49 per cent respectively while the lowest C.V. was observed in onion 31.37, 84.14 and 100.08 per cent respectively.

#### **Coefficient of Variation of Export Value in Spices**

Table 2 shows that, during the pre-WTO period, post WTO period and overall period under study the highest C.V. was observed in Cumin with 65.65, 96.41 and 119.18 percent respectively. The lowest C.V. with 36.45 per cent was observed during the pre-WTO period in Chilli, while in post-WTO period and overall period under study the less C.V. was observed in black pepper 52.04 and 62.58 per cent respectively.

#### **Export competitiveness of selected vegetables and spices**

In the present study Nominal Protection Coefficient (NPC.) as a measure of assessing competitiveness to measure the degree of protection to the domestically produced commodity is estimated and presented in Table 3 and Table 4.

#### **Brinjal**

Table 3, revealed that during the average overall period NPC of Brinjal is less than one (0.23) over the years, indicating that India has comparative advantage in the export of Brinjal. The domestic prices of Brinjal are observed to be less than the international prices. Hence exporting Brinjal to other countries is more remunerative.

#### **Tomato**

It is a very sensitive commodity. Its prices are fluctuating in the domestic market. The average overall under study, the period NPC of tomato was observed to be less than one (0.65) thereby indicating the scope for increasing export. But now a days domestic input support are given to tomato hence it is beneficial to sell it in the international market through export.

#### **Onion**

3 further showed that during the average overall period under study, the NPC of onion is formed to be less than one (0.55) over the years, indicating that India has comparative advantage in onion export. The domestic prices of onion are less than international prices. As result of which exporting onion to other countries are supposed to be remunerative more benefited.

#### **Black pepper**

It is a very sensitive commodity. Its prices may fluctuate in market. During average overall period under study, the NPC of black pepper is observed to be less than one (0.87) to indicate the scope for increasing export of black pepper. But now a days domestic input supports are provided to black pepper. Hence it is beneficial to sell it in the international market.



### Coriander

Table 4 revealed that during the average overall period under study NPC of coriander was found to be less than one (0.77) over the years, indicating that India has comparative advantage in coriander export. The domestic price of coriander is also less than the international prices. Hence exporting coriander also to other countries gives more benefit to the farmer.

### Cumin

Table 4 indicated that the average overall period under study, the NPC of cumin was found to less than one (0.83) over the years, further indicating that India has comparative advantage in cumin export. The domestic prices of cumin is less than international prices hence exporting cumin to other countries gives more benefit.

### Chilli:

Table 4 revealed that the average overall period under study, the NPC of Chilli was found to less than one (0.84) over the years, indicating that India has also a comparative advantage in Chilli export. The domestic prices of Chilli observed to be less than the international prices. Hence exporting Chilli also to other countries gives more benefit.

### Conclusions

The export performance in terms of growth rates of selected vegetables and spices in terms of export quantity and value was positive and significant. The export performance in terms of growth rates of tomato, onion, black pepper and Chilli in terms of export quantity and value was positive and significant. Average NPC indicated that selected vegetables and spices have, NPC less than one, indicating export competitiveness of these crops. The share of agriculture on total export was highest in period-I, but after the establishment of WTO it goes on decreasing continuously over the year. India's share of agricultural export to total export continuously goes on decreasing. Thus it is concluded that India's continues development in Industrial sector and exports of processed products.

### Policy and Implication

Export is an important activity to accelerate the pace of economic development of any country. However; India's export performance is not encouraging due to many factors. There is need to develop strategies to enhance export and restrictions in large scale imports, for this purpose concentrated efforts would be needed to increase production through increasing productivity.

With a view to doubling the India's share in global export, the only area where India has scope of occupying a major share in global market is vegetables and spices where the country is now the largest producer.

In the view of mounting deficit in balance of payment, it is important to augment our foreign exchange resources to promote economic growth on self-sustaining principles.

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**Table 1: Growth rate of Export Quantity, Export Value, Import Quantity and Import Value of Selected Vegetables and Spices in India**

Sr. No	Crops	Export Quantity (tonnes)			Export Value (in lakh)			Import Quantity (tonnes)			Import Value (1000US\$)		
		Period I	Period II	Overall	Period I	Period II	Overall	Period I	Period II	Overall	Period I	Period II	Overall
Vegetable													
1	Brinjal	--	59.05***	41.38***	--	272.37***	161.69***	--	--	--	--	--	--
2	Tomato	67.93*	50.42***	43.75***	45.21	58.22***	49.26***	--	42.60***	28.18***	--	38.47***	25.53***
5	Onion	12.54***	11.88***	8.30***	21.63	17.27***	15.36***	--	32.58	32.64**	--	27.57	27.16**
Spices													
1	Black Pepper	14.52	-1.16**	-0.90**	31.77	-0.72	5.08*	0.60	16.27***	15.91***	-3.20	16.40***	20.49***
3	Coriander	29.06	7.38***	8.14***	41.02	13.62***	15.58***	--	--	--	--	--	--
4	Cumin	50.12***	13.43***	16.99***	66.63***	19.84***	23.76***	--	--	--	--	--	--
5	Chilli	-4.46	11.71***	12.88***	13.23	16.25***	18.60***	-38.04	31.87***	41.12***	-34.01	30.69***	46.94***

Note: \*\*\*significant at 1per cent level, \*\*significant at 5per cent level, \*significant at 10 per cent level  
Period I - pre WTO (1988-89 to 1994-95), Period II- post WTO (1994-95 to 2012-13), Overall - (1988-89 to 2012-13)  
-- Data not available

**Table 2: Coefficient of Variation Export of Selected Vegetables and Spices in India**

Sr. No.	Crop	Coefficient of Variation					
		Quantity (in tonnes)			Value (in lakh)		
		Period I	Period II	Overall	Period I	Period II	Overall
<b>Vegetables</b>							
1	Brinjal	-	124.78	145.14	-	124.78	145.14
2	Tomato	114.07	125.65	177.34	111.80	151.92	181.49
5	Onion	18.93	61.27	65.54	31.37	84.14	100.08
<b>Spices</b>							
1	Black Pepper	36.35	35.83	35.27	56.45	52.04	62.58
3	Coriander	40.4	43.87	52.89	46.11	74	91.09
4	Cumin	62.73	75.05	94.28	65.65	96.41	119.18
5	Chilli	26.74	56.78	73.56	36.45	80.76	101.39

**Table 3: Nominal Protection Coefficient of selected vegetables in India**

Sr. No.	Years	Brinjal	Tomato	Onion
1	1988-89	0.00	0.00	0.00
2	1989-90	0.00	0.12	0.54
3	1990-91	0.00	0.37	0.44
4	1991-92	0.00	0.23	0.73
5	1992-93	0.33	0.40	0.37
6	1993-94	0.21	0.86	0.68
7	1994-95	0.00	0.56	0.43
	Average Pre WTO Period	0.08	0.36	0.46
8	1995-96	0.00	0.59	0.53
9	1996-97	0.00	0.71	0.61
10	1997-98	0.00	0.97	0.80
11	1998-99	0.00	0.70	0.59
12	1999-00	0.00	0.62	0.39
13	2000-01	0.38	0.66	0.41
14	2001-02	0.56	0.72	0.25
15	2002-03	0.00	0.87	0.60
16	2003-04	0.26	0.85	0.40
17	2004-05	0.24	0.78	0.74
18	2005-06	0.15	0.79	0.38
19	2006-07	0.24	0.81	0.87



20	2007-08	0.16	0.80	0.82
21	2008-09	0.22	0.84	0.52
22	2009-10	0.77	0.91	0.60
23	2010-11	0.74	0.71	0.65
24	2011-12	0.78	0.65	0.61
25	2012-13	0.61	0.63	0.68
	Average Post WTO Period	0.28	0.76	0.58
	Average Overall Period	0.23	0.65	0.55

**Table 4: Nominal Protection Coefficient of selected Spices in India**

Sr. No.	Years	Black Pepper	Coriander	Cumin	Chilli
1	1988-89	0.43	0.44	0.37	0.33
2	1989-90	0.52	0.57	0.65	0.63
3	1990-91	0.75	0.89	0.71	1.26
4	1991-92	0.87	0.85	1.02	1.38
5	1992-93	0.86	0.85	1.15	0.93
6	1993-94	0.97	0.84	0.95	0.67
7	1994-95	0.78	0.82	0.75	1.02
	Average Pre WTO Period	0.74	0.75	0.80	0.89
8	1995-96	0.89	0.87	0.86	1.22
9	1996-97	0.85	0.54	0.98	1.01
10	1997-98	0.87	0.98	0.92	0.85
11	1998-99	1.07	0.76	0.84	0.76
12	1999-00	0.96	0.75	0.84	0.73
13	2000-01	0.89	0.81	0.56	0.71
14	2001-02	1.41	0.87	0.92	0.78
15	2002-03	0.93	0.84	1.07	0.78
16	2003-04	0.91	0.81	0.75	0.91
17	2004-05	0.89	0.99	0.72	0.71
18	2005-06	0.81	0.91	0.77	0.52
19	2006-07	0.92	0.77	0.94	0.89
20	2007-08	0.84	0.72	0.96	0.77
21	2008-09	0.79	0.46	0.94	0.79
22	2009-10	0.86	0.72	0.93	0.80
23	2010-11	0.96	0.86	0.90	0.84
24	2011-12	0.88	0.65	0.76	0.79
25	2012-13	0.75	0.71	0.61	0.81
	Average Post WTO Period	0.92	0.78	0.85	0.82
	Average Overall Period	0.87	0.77	0.83	0.84